TELEPHONE ENGINEER

THE INTERNATIONAL TECHNICAL JOURNAL

COVER ILLUSTRATION

New Compressed Air Cleaning System for Telephone Equipment

ARTICLE ON PAGE 29

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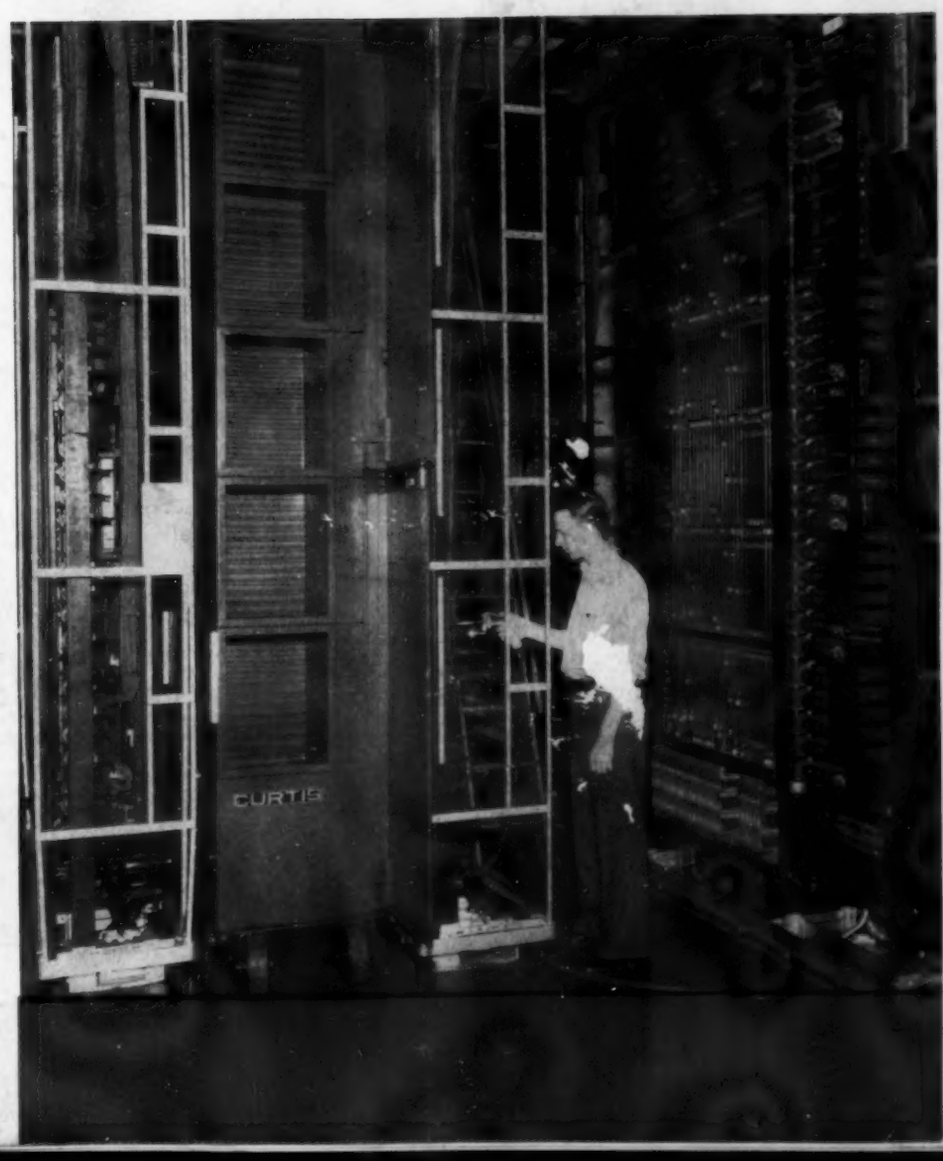
1934 FARM PROFITS FOR TELEPHONES
Page 13

GAS FILLED CABLES
Page 19

OCTOBER, 1934



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MAKERS OF VOICE TRANSMISSION AND VOICE RECEPTION APPARATUS FOR MORE THAN FORTY YEARS

Telephone Engineer

A MONTHLY SERVING ENTIRE TELEPHONE INDUSTRY

30-DAY LIFE FOR READERS AND ADVERTISERS

The International Technical Journal

Founded in 1909

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We Thank You

Wish to compliment you on your excellent magazine *Telephone Engineer* which is received regularly each month in this office.

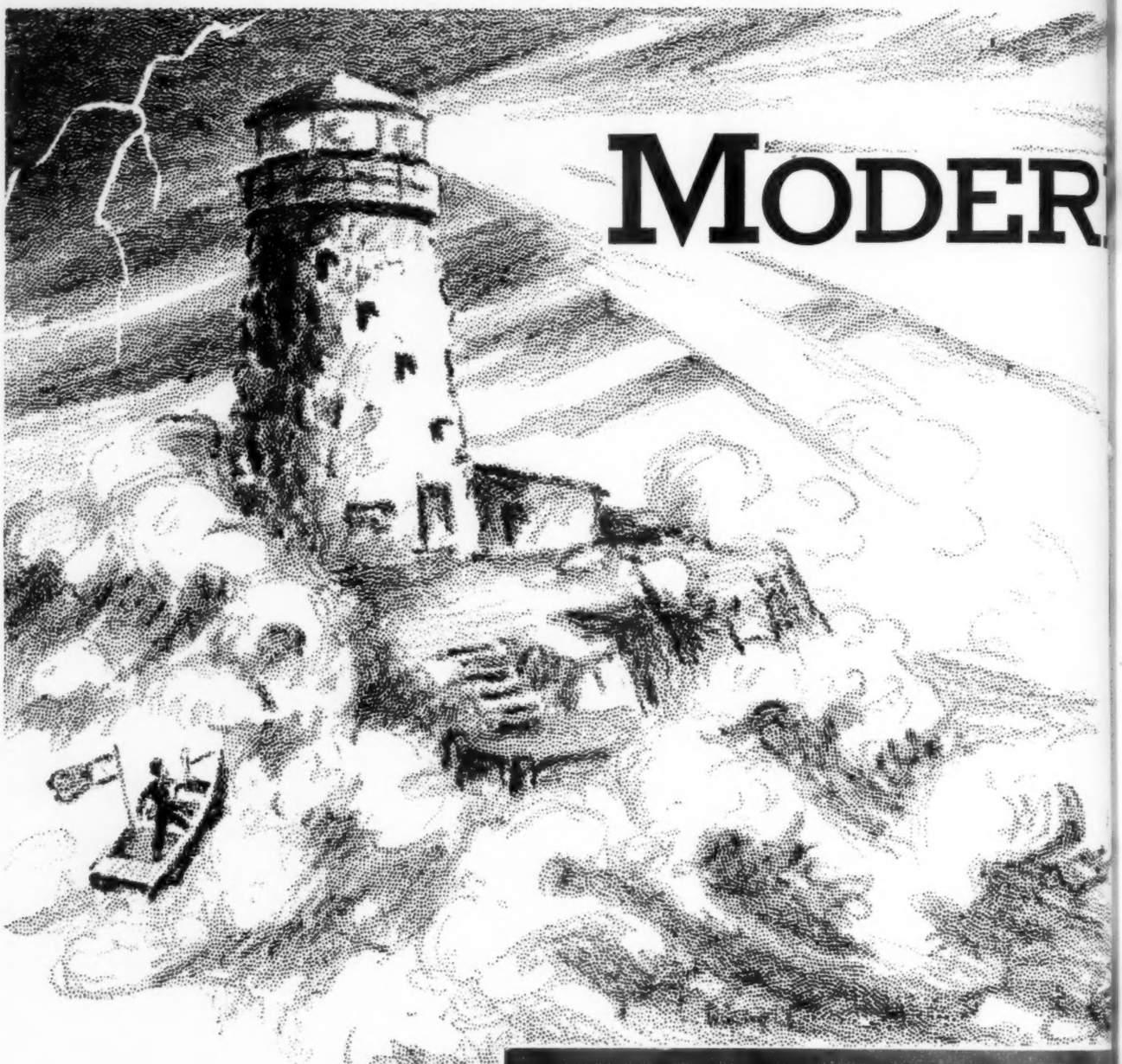
Articles covering telephone subjects such as new inventions, improvements, etc., are well written and a copy of the *Telephone Engineer* should be in every exchange.

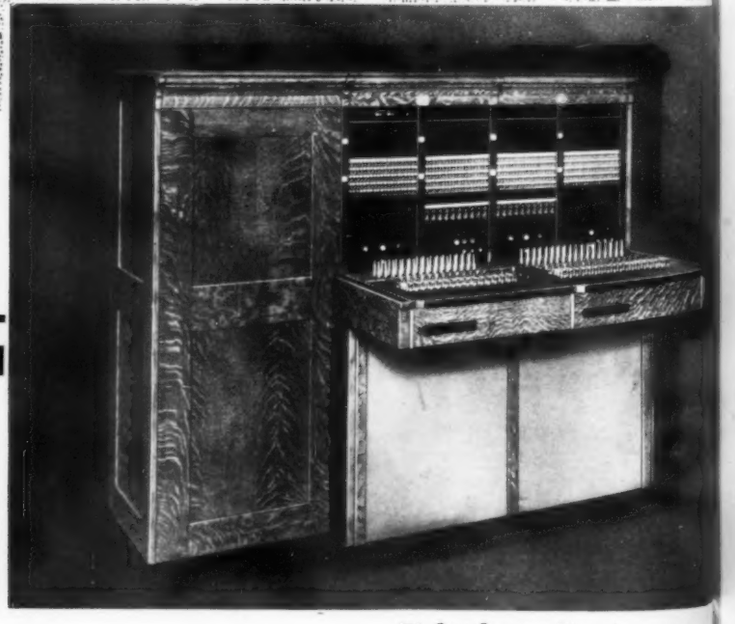
With best wishes for your continued success.

J. E. Stuart, Vice-Pres.
Two States Telephone Co.
Texarkana, Tex.

Enclosed find money order for subscription to *Telephone Engineer*. The July issue was a surprise. Man you are getting advertising. I note the quality of the paper and illustrated front cover. It beats the former bunch of stereotyped ads. *Telephone Engineer* is a telephone magazine. Keep telephone pictures on the cover.

D. H. Townsend
Churchill Co. Tel. & Tel. Co.
Fallon, Nev.





SINCE 1897
KELLOGG

EDITORIAL

Ford Again Leads the Way

Henry Ford's recent decision to "plunge" $18,000,000 for a new steel plant and $5,500,000 in the next ten months for replacement of equipment indicates clearly that he has all the confidence in the world in the future of American business. His action should be an incentive to other business executives to make whatever expenditures possible for the building of new plants and purchases of new equipment or the rehabilitation of old. If every unit of industry would follow Mr. Ford's example and would show the same degree of confidence in the future as he has exhibited economic recovery would be well on its way overnight.

This is not the first time Mr. Ford has made "plunges" when the future of business seemed dark and treacherous to others and the most interesting part of it all is that they were always successful "plunges". No doubt the success the Ford Motor Co. has enjoyed is the result of its founder's courage and his sincere confidence in America and her people and their ability to overcome any obstacle no matter how great or small.

- Spends $23,500,000
- Example for Others
- Not First Time
- More Is Needed

Some economists say that the one thing needed to bring back recovery is confidence and the will to spend on the part of those who have the money to spend. While Mr. Ford's $23,500,000 expenditure is a mere "drop in the bucket" to what is needed to bring us out of the depression, his inspiring courage cannot be measured. Considering Mr. Ford's past experience and ability to "make a strike", surely his example should be an incentive to all business leaders today.

R. C. Reno

EDITOR

The Telephone Business As We See It

Time To Get After Farm Telephones

Special attention is called to the article "1934 Farm Profits For Telephones" on page 13. This report of the agricultural outlook should be most interesting and inspiring to telephone companies which depend on rural stations for a portion of their revenues.

It is estimated by reliable sources that the farm income this year will be a billion dollars greater than that in 1933. While individual farm losses have of course been severe the above estimate indicates that farmers as a whole will have more buying power than last year even though some individual farmers have had hard luck and have lost a large part of their crops and livestock.

National advertisers have recognized the importance of the increased farm market and are directing more selling activity toward the consumers in the agricultural field. This jump in farm income should have a decidedly good effect on local farming communities and the nation's business in general. It is safe to predict that the farmers will use any added revenue, in the first place, to pay off old debts which will improve the local merchants and bankers' condition; secondly, some of it will go for the purchase of manufactured products and equipment, necessities and conveniences.

The telephone is one of the most vital and valuable necessities and conveniences needed by the successful and aggressive farmer and now that a large part of the farm market will be able to respond in normal or better than normal degree to the efforts of advertisers, telephone companies will be justified in doubling their efforts to sell more rural telephones.

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Need of Uniform Accounting System

Those desiring to file exceptions, objections or suggested amendments to the recent report on accounting rules for telephone companies have until November 1 to do so under an order by the FCC, postponing the filing deadline from October 1 to that date. This extension of time was granted in consideration of a request for a postponement to January 1, 1935 by state utilities commissions.

The commission further ordered November 16 as the date for oral argument on the report before the Telephone Division of the FCC in its hearing room at Washington. Telephone companies have been unanimous in advocating a uniform accounting system be used by both state and federal regulatory bodies. It is hoped that members of the federal commission, state commissions and telephone operating men will sit down together, put their cards on the table, frankly air their views and develop a uniform procedure which will eliminate any possible disagreement in the future and any overlapping of jurisdiction between federal and state agencies.

When the Communications Act of 1934 was pending Independent telephone men took the stand that state commissions should have a voice in the formation of a telephone accounting system and above all they recommended uniformity. It is expected that they will make this stand in the hearing next month.

In presenting their cases, state commissioners no doubt will insist that they have absolute jurisdiction over the bulk of Independent operating companies, under certain sections of the Communications Act, pertaining to intrastate and exchange telephone business. The law clearly defines the authority of the state agencies over telephone companies doing only intrastate business and those agencies no doubt will see to it that none of this power is taken away or reduced by the federal commission. They also should demand a uniform system of accounting.

▲ ▲ ▲

Inflation and Telephone Buying

In discussing and predicting real inflation based on opinions by trained observers at Washington the *Ohio Telephone News* has the following good advice for telephone operating companies.

" . . . Operating independent telephone companies with fixed and inflexible rate structures necessarily dread the threat that inflation presents. Under existing laws there is little they can do to anticipate and prepare for such evils, other than by placing their physical plant in the very best condition, and by expending ready money for needed equipment, supplies and materials. . . .

"In view of the peculiar regulatory position in which the utilities, and particularly the telephone companies, are placed, none of them should be content to leave undone a single thing that will help to maintain its soundness and serviceability. . . . .

"A plan that immediately suggests itself is for the companies to proceed at once to buy or contract for their total requirements during the next 12 or 18 months. Wherever equipments will be needed during the next two or three years, it will be common horse sense to let such contracts now, specifying delivery for a future date. All circumstances considered, a 100% plant is vastly preferable to a fat bank account that is entailed for purposes of accrued depreciation.

"Inflation, if and when it comes, will not last long. Financial diseases, like the acute ills to which humans are subject, run their course in a comparatively short time. Companies that will not have to make heavy purchases during such a period stand a far better chance of emerging from such a period in solvent condition. Those who must buy at peak will have to take terrific losses. The ones that should buy, and fail to buy, will be subject while inflation progresses to a terrific battering from subscribers and press."

Power Line NOISE REDUCTION

● Last installment of a series on the reduction of power line noise in telephone circuits by Mr. Burden. This is one of the most difficult problems of the telephone man and Mr. Burden's articles have created tremendous interest in the operating field.

By
B. C. BURDEN

Transmission Engineer
Lincoln Neb. Tel. & Tel. Co.

IN THIS fourth and concluding article of a series on power noise reduction in telephone circuits, a number of miscellaneous factors of the problem are discussed. The many ramifications of the inductive interference problem require that those who are called on to solve noise problems be reasonably familiar with both the many conditions that may result in excessive noise and the various feasible plans for reducing noise.

The reports published by the "General Joint Committee on Inductive Interference" contain much valuable detailed information on the inductive interference problem and make useful reference sources for Independent Companies.

Guiding Principles

In a report published by the joint committee in connection with an investigation of inductive situations in California the following guiding principles for minimizing inductive interference were recommended, and in handling inductive problems they should be kept in mind.

1. Avoidance of close proximity

By no other means can complete freedom from interference be secured.

2. Elimination or suppression of harmonics

To the existence of harmonics is due practically all interference to telephone circuits under the normal operating conditions. Improvement in this respect may be effected by giving due regard paralleling power and telephone circuits to its importance in the purchase of new equipment, and proper operation of equipment.

3. Limitation of residuals

The intensity of induction due to residual voltages and currents is relatively more severe than that due to balanced voltages and currents and induction arising from residuals cannot be neutralized by power transportations. They can be lessened by balancing the line and also the load, by the use of advantageous transformer connections, and by the avoidance of excessive magnetic density in the iron cores of transformers.

4. Reduction of intensity of induction by favorable arrangements of conductors

Within the latitude afforded by various practical configurations of power and communication circuits the induction with some arrangements is of much less intensity than with others. In cases of twin-circuit power lines important advantage can be secured by care in fixing the phase relations of the conductors of the several circuits.

5. Neutralization of induction by co-ordinated transposition systems

By means of transportations in both classes of circuits within a parallel the phase or direction of the induction may be controlled so that mutually neutralizing effects are created in neighboring lengths of circuit. **To be effective the transposition systems of the two classes of lines must be co-ordinated.**

6. Balancing of metallic communication circuits

Accurate balancing of metallic communication circuits, particularly telephone circuits, tends to reduce the disturbing effect of induction between paralleling power and telephone circuits. Unbalances are reduced by transposing the conductors and by careful design, construction and maintenance of lines and apparatus.

7. High-grade construction and care in the operation and maintenance of power circuits

No means are known, except increased separation of the two classes of lines, whereby the severe monentary disturbances to communication circuits, due to abnormal conditions on neighboring power circuits, can be entirely prevented; hence, the importance of minimizing such occurrences by high standards of construction, operation and maintenance.

Discussing, in the order given, each of the above guiding principles for preventing interference: First, "avoidance of close proximity." Where a power-telephone line parallel is proposed, the companies involved should carefully examine alternative routes in an effort to avoid the parallel, if possible. If parallels are unavoidable, then best inductive coordination results will be obtained where minor power lines; that is, the low voltage-low power type line used to feed rural customers, be allowed to parallel the major telephone circuits (toll), whereas the major or high power type transmission lines used between towns be allowed to parallel the minor lines of the telephone company such as rural subscribers lines. By following out this plan the inductive problem is somewhat minimized.

Guiding principle No. 2 states that it is desirable to keep the harmonic content of the power wave as low as possible. As has been previously stated, harmonics are merely multiples of the regular power frequency. For example, the second harmonic of a 60 cycle line would be 120 cycles, the third 180 cycles, and the fifth 300 cycles, etc. While the magnitude of these harmonics is seldom large as compared to the power frequency, nevertheless their interfering

effect is many times greater than the fundamental frequency; hence, they should be kept as low as possible. Harmonics are apt to be quite bad where (1) banks of transformers are star connected, (2) where power transformers are greatly overloaded, (3) where certain types of poorly designed generators and motors are connected to power lines, and (4) in some cases by special types of power equipment such as large mercury arc rectifiers such as are used in converting alternating current to direct current for street railway use. The majority of power companies will be found ready and willing to cooperate in plans for the correction of bad wave form. However, harmonics do not interfere with the normal operation of power circuits; hence, the power company, in many cases, will not concern themselves with the problem unless it is pointed out by communication companies.

Wave Form Analysis

In connection with inductive interference cases where interference seems unusually severe for the length of parallel and voltages involved it may be necessary and desirable for the telephone company to make an analysis of the power company's wave in order to determine the interfering harmonics and their relative magnitude.

An analysis of wave form can be made by means of two instruments, one known as a **Wave Analyzer** and the other as a **Telephone Interference Factor Meter.** The wave analyzer consists of a tuned circuit calibrated in cycles and which when connected to a circuit whose wave is to be analyzed can be tuned to each of the principle harmonics present and by means of a regular noise measuring instrument the relative magnitude of the harmonic determined. The Telephone Interference Factor Meter is used to measure the relative interfering effect of power waves. This instrument consists of a sensitive thermocouple type milliammeter which is used to measure the voltage across and the current through a complex network. The network is designed so as to have a frequency response curve approximately the same as a curve in which the relative interfering effect of various frequencies is plotted against frequency. These instruments are quite expensive and are seldom found in the plants of the smaller companies. However, most Bell System companies have available such instruments and some arrangement can generally be made by Independent Companies for measurements to be made where an inductive problem is sufficiently severe to warrant this sort of investigation.

Good Advice

We are about to enter the fourth and last quarter of 1934, and there remains at least sixty days in which to straighten poles, reinforce corners, pull slack, trim trees and brush, replace broken tie wires, insulators and inspect sub-station equipment. The wise manager will see that this is done to avoid interruptions to service during the long winter months, and avoid expensive trips over country roads that may be blocked by winter snows (and incidentally, while this sub-station inspection is being made, it is a good time to present your statements for collection to your delinquent subscribers).—Minnesota Telephone Bulletin.

The necessity for limiting residual components of voltage and current in power lines to small values was discussed in Section 3. In this concluding article of the series on noise reduction the author wishes to again stress the importance from an inductive standpoint of keeping residual components low. Failure to do this will generally result in inductive situations to which the ordinary remedial measures will not prove satisfactory and which will generally create noises which are almost intolerable in paralleling telephone lines. As was shown in Part 3, power line transpositions will not reduce the effect of residuals. The only satisfactory solution to the problem is to eliminate them at their source. Some of the sources of residuals are (1) Unbalanced line loads, (2) line leakage, (3) improper transformer connection, (4) overload transformers, (5) single phase extensions of three phase lines, etc. The principles laid down by the General Joint Committee recognized that it is a definite obligation of power companies to construct and maintain their lines so that residuals are kept at a minimum. Again, as in the case of harmonics, it is, in many cases, up to the telephone companies to recognize and acquaint power companies with the fact that their lines are being operated so as to create residuals which are or may be a source of trouble to the telephone company.

Effect of Wire Configuration

Principle 4 states that line conductor configurations which have the least interfering effect to paralleling communication circuits should be selected. This necessity is brought about by the fact that unless the conductors are properly arranged on the supporting structure, the capacity of certain of the phase wires to ground may be greatly different than that of the other wires; hence, will tend to set up residual voltages or currents which will result in an increased interference from the power line. This is especially true when a power pole line carries twin circuits. In such cases the conductors which are paralleled should be carefully selected so as to minimize capacity unbalance to ground.

Principle No. 5 states that a system of coordinated transpositions are desirable in all power-telephone parallels. This is certainly true of all new construction and in many cases power lines which were built before the practice of using coordinated transposition schemes were generally known, should now be transposed so as to fit in or coordinate with telephone lines which are properly transposed. A good coordinated transposition scheme is only possible where power and telephone companies involved in parallels keep in close touch with each other in connection with new construction and where a cooperative attitude is taken. If both power and telephone lines are kept well balanced electrically and properly coordinated transpositions placed, there are a few parallels which will give noise values that are unsatisfactory for commercial use.

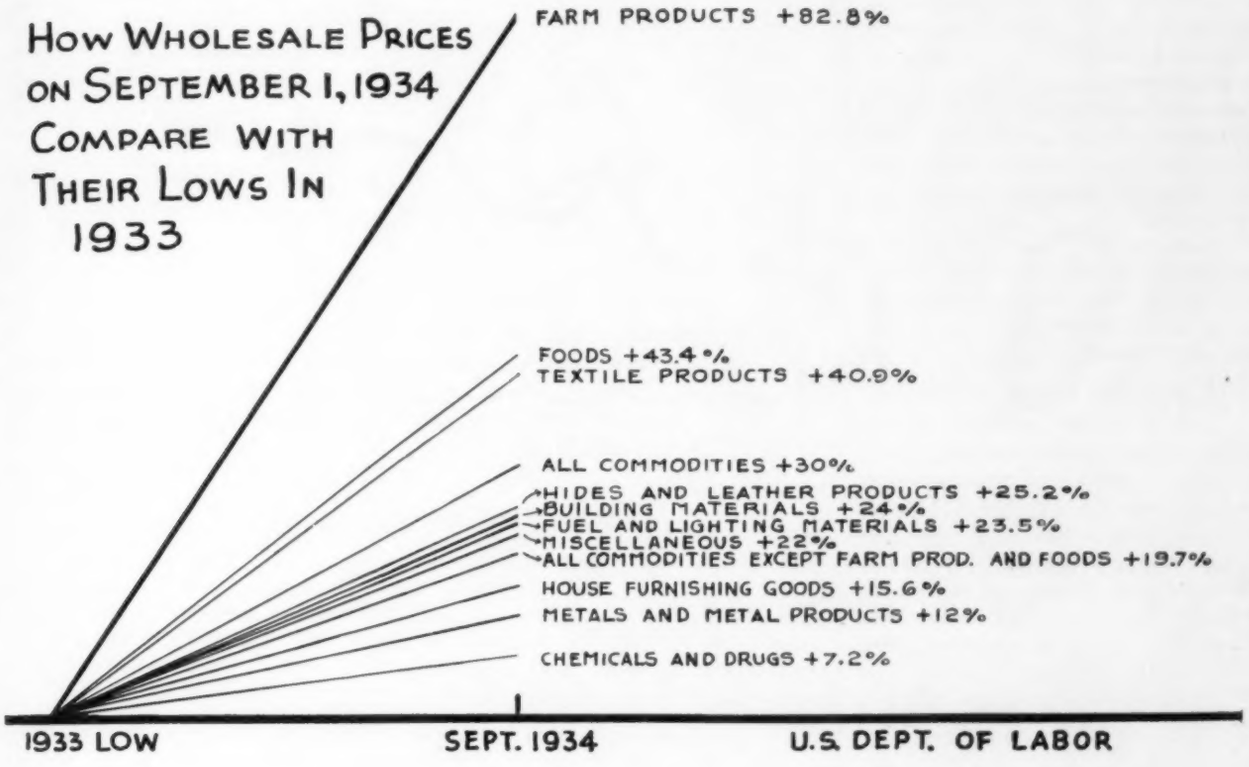
Induction Susceptiveness

Principle No. 6 recommends that an accurate electrical balancing of metallic communication circuits will tend to reduce the disturbing effect of induction from paralleling power circuits. Power companies have the obligation of keeping their lines well balanced electrically in order to reduce the inductive influence of their circuits to paralleling communication circuits. Telephone companies likewise have an **obligation to construct and maintain their circuits so that they are well balanced electrically both with respect to series impedance and balance to ground.**

In other words, telephone companies should reduce the inductive susceptiveness of their circuit to a minimum. The electrical balance of a telephone circuit requires that the series resistance of each of the line wires be the same and that the capacity between each of the wires and adjacent circuits and ground be equal. A primary requisite of balance is, of course, a metallic cir-

(*Please turn to page* 38)

1934 FARM Profits For TELEPHONES


HOW WHOLESALE PRICES ON SEPTEMBER 1, 1934 COMPARE WITH THEIR LOWS IN 1933
FARM PRODUCTS +82.8%
FOODS +43.4%
TEXTILE PRODUCTS +40.9%
ALL COMMODITIES +30%
HIDES AND LEATHER PRODUCTS +25.2%
BUILDING MATERIALS +24%
FUEL AND LIGHTING MATERIALS +23.5%
MISCELLANEOUS +22%
ALL COMMODITIES EXCEPT FARM PROD. AND FOODS +19.7%
HOUSE FURNISHING GOODS +15.6%
METALS AND METAL PRODUCTS +12%
CHEMICALS AND DRUGS +7.2%
1933 LOW
SEPT. 1934
U.S. DEPT. OF LABOR

By
RALPH C. RENO
Editor
TELEPHONE ENGINEER

IT IS seldom that a telephone trade magazine has reason or the opportunity to publish a report of the agricultural situation in this country. One naturally would think that an article of this kind would and should be published by farm publications for those having a direct interest in the American farmer and his economic situation.

But a review of the telephone business over the past few years will prove that our industry has more than a passing interest in the immediate and future agricultural outlook. An analysis of the past will show that the depressed condition of the farmer has been responsible for a portion of the tremendous drop in local and toll telephone business during the last two or three years. In some cases the inability of the farmer to keep his telephone has put operating companies in a precarious financial condition, which will not be alleviated until a goodly number of farmers are able to re-install their telephones.

This fact, then, establishes the soundness of a telephone journal publishing a general report on the farming industry to show telephone operating companies what they can expect from their agricultural communities. TELEPHONE ENGINEER has done considerable research work in this direction and is presenting its findings to impress telephone men with the possibility of improving their present and future business.

The Agricultural Outlook, a bulletin prepared by the editorial staffs of several leading farm publications including *The Farmer and Farm, Stock and Home, The Nebraska Farmer, Prairie Farmer, Wallace's Farmer and Iowa Homestead and Wisconsin Agriculturist and Farmer* with the assistance of Gilbert Gusler, Agricultural News Service says that farm profits are reappearing, that the farm folks are smiling again and that the farm income for 1934 will be a billion dollars greater than the 1933 income. This, the bulletin says, is the result of higher prices, greater cash income, reduced farm capitalization, taxes, interest and labor costs and federal government aid.

This advancement in the farm economic condition has revived selling and merchandising activities of several industries in the agricultural regions which show the greatest improvement. The radio industry, for example, is introducing a new farm battery radio which compares favorably with the electrically operated set; we are told the farm machinery people are doubling their selling efforts; mail order supply houses are diverting more of their attention to their farm market. And—so it goes. One thing is certain and that is the old rule of "first come first served" will apply in this case.

It is from this angle that this article is written. The telephone industry cannot afford to stand by and permit the farmer to spend all of his increased income for items and services not half as necessary and vital to his welfare as telephone service. It is all well and good for the telephone manager to sit idly by and to think he knows whether or not his rural prospects can afford

a telephone, but he never is certain until he makes a personal call and at least presents a selling argument.

A personal contact selling campaign should immediately be made in all rural homes without telephones in the communities where there have been definite upswings in farm income. One of the best sales arguments that could be used is, now that the farmer's condition is better with indications that it will continue to improve, he needs the telephone for communication with his elevator or farm bureau to keep himself more informed about market prices, etc. Then, too, there is the fact that a telephone is the most economical life, health and fire insurance a farmer can buy.

Perhaps the most improved section is the Middle West. The report of *The Agricultural Outlook* for September, giving data and statistics covering that part of the country is presented below:

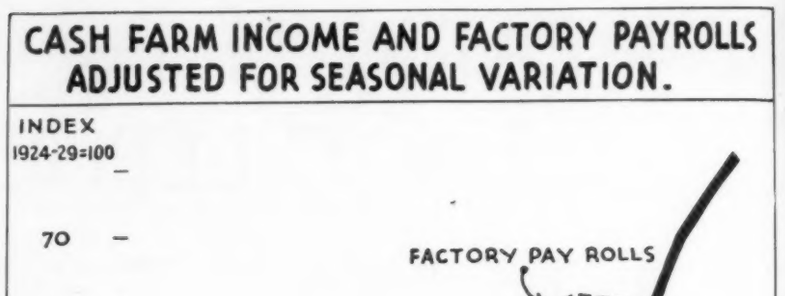
THE AGRICULTURAL OUTLOOK
(September issue)

The farmer's books are coming out of the red. Net capital return of farm operators was 1.9 per cent in 1933, as compared with a loss of 4.2 per cent in 1932 and a loss of 2.8 per cent in 1931. The net capital return in 1925, the best year of the last decade, was 5 per cent. Farm income for 1934—a billion dollars more than 1933—will raise net capital return close to the 1925 record figure.

This favorable showing is not due entirely to higher prices and greater cash income. Farm capitalization has been written down, taxes and interest are lower and labor costs are less.
are less.

A fundamental economic adjustment is taking place in the shift of buying power from city to country, as shown by price changes during the past year, illustrated in the chart on page 13. It was the shift of income from farm to city in the decade following 1921 which upset the economic balance of the country. Surplus income in the cities financed excessive speculation, while deficient income on the farms reduced the buying power that was necessary to maintain our industrial production. A reversal of that trend is a necessary forerunner to general recovery. The substantial start made in that direction is encouraging.

Even more important than the billion-dollar increase in farm income this year is the change in farm psychology. Except in the worst of the drouth sections, discouragement has given way to hope, and farmers are planning more constructively for the future than they have for many years. The sporadic farm strikes which were making headlines a year ago have disappeared; the strike problem is now in the cities rather than on the farm.



To the business man this changing situation means that the farm market deserves careful study; that it will be an increasingly important factor in sales plans.

General rains throughout the Middle West during the past month are stimulating growth of pastures and fall feed and putting the soil in shape for fall wheat and rye. Government purchase of cattle in drouth districts is proceeding, though at a slower rate. There are extensive private movements of livestock from feed-deficit to feed-surplus areas. Government underwriting of a price of $7 to $8.50 per ton for baled corn stover will insure full utilization of this roughage, most of which is ordinarily not used.

Government crop estimates for September showed a small gain in wheat and barley, and a substantial loss in corn. Total production of the latter grain is placed at 1,485,000,000 bushels. Total value of the 1934 grain crops, including benefit payments, will be higher than in 1933 in most states. Minor crops, yield of which is not so greatly reduced, will add much more substantially than usual to farm income.

Livestock prices reached new levels for the recovery period during the past month. With the peak of drouth liquidation past, livestock supplies are small enough in relation to demand to assure favorable prices for some months to come. Excess production of dairy and poultry products has been eliminated by disposal of surplus producing stock. There will be some recession in hog prices during the next two months in line with the seasonal trend, followed by a very favorable price situation during the winter and spring.

The farm price index reached 87 August 15, as compared with the five-year pre-war period at 100. This was an advance of seven points in the month.

The relation of farm to other prices also improved. The index was 71 August 15, as compared with 64 a year ago and 50 at the low point of 1933. Including benefit payments, wheat and corn are now bringing farmers more than pre-war parity, and hogs have risen from 35 per cent of parity last December to nearly 90 per cent of parity.

With increased returns from cash sales supplemented by benefit payments and drouth relief in various forms, farm income is showing more than the usual seasonal rise.

Payment of corn-hog benefit payments, though behind schedule, is going forward rapidly. The total yet to be paid to farmers in Indiana, Illinois, Wisconsin, Minnesota, Iowa, the Dakotas and Nebraska, is about 140 million dollars, with 62 more million to be paid during the early months of 1935.

Current corn prices enable government corn loans to be liquidated with a substantial balance left for the grower. Many farmers are selling only enough to liquidate their loan and retaining the balance for feed.

Government loans on farm-stored corn have been extended (applying to both old and new corn crop) at 55 cents a bushel.

The drive for enlargement of export markets for farm products by means of reciprocal trade agreements started with the Cuban treaty. This opens a new market for the products of one million acres of United States farm land by increasing Cuban imports, mostly of wheat and pork products.

Farmers Get Billion More

The cash farm income during 1934 (United States Department of Agriculture estimates) will be $6,000,000,000—a billion dollars ahead of 1933 and $1,672,000,000, or 42 per cent, ahead of 1932. This year's farm income will slightly exceed that of 1931. The year 1934 is seeing farmers a substantial part of the way up recovery hill.

Cash income from sales and benefit payments during the first seven months of 1932 was $3,074,000,000, as compared with $2,512,000,000 for the same period in 1933. Estimated farm income from August to December, inclusive, will be $2,926,000,000, as compared with $2,536,000,000 for the same months of 1933.

These figures are based on actual monthly cash income of farmers, and are not available by states. The Department also issues an estimate of "cash income from farm production" for each agricultural year. This includes the value of livestock and livestock products sold during the calendar year, while returns from crops are computed on the basis of prices during the marketing year for each crop. These figures for the United States and for the eight Mid-West states of Indiana, Illinois, Minnesota, Iowa, the Dakotas and Nebraska are as follows:

	United States	Eight Mid-West States
1931	$5,795,000,000	$1,748,000,000
1932	4,366,000,000	1,257,000,000
1933	5,253,000,000	1,339,000,000

To September 12, government purchases of cattle in 21 states had reached 5,164,954 head—about 13 per cent of the cattle population of those states. The average price was $13.54 per head. The following table shows purchases and payments in Mid-West states.

	Number	Payments
Wisconsin	44,000	$ 597,000
Minnesota	193,000	2,600,000
Iowa	11,000	149,000
North Dakota	913,000	12,357,000
South Dakota	687,000	9,296,000
Nebraska	245,000	3,322,000
Total	2,093,000	$28,321,000

The prices paid exceed regular market values. The decrease in the cattle population is increasing the value of the inventory remaining on farms (poorest producers are sold) and opening the way to more profitable production.

Crop Values Higher

Using Chicago prices on September 12 and on the corresponding date in 1933, the combined value of five grains in Indiana, Illinois, Wisconsin, Minnesota, Iowa, the Dakotas and Nebraska is $974,000,000 compared with $1,009,000,000 last year, as indicated in the accompanying table. Adding the benefit payments for wheat and corn, the total value is $1,089,000,000 compared with $1,041,000,000 last year, an increase of nearly five per cent.

Farm Improvements

The Federal Housing Administration offers to bankers, manufacturers and dealers favorable opportunity to create business under the remodeling and improvement plan. To bankers it offers an opportunity to loan money for these purposes with 20 per cent of the total risk underwritten by the government. Loans are made on a five per cent discount basis, which will net banks 9.72 per cent interest when payments are made monthly (less in case of farmers where payments may be less frequent).

To manufacturers and dealers it offers an opportunity to supply the large potential market in this field, on an unusually low-rate installment plan without down payment, and with the government actively helping promote the plan.

To property owners, it offers an opportunity to make needed improvements and repairs so as to stop further deterioration of their property, and on favorable financial terms, with payments extending over three years and in some cases five. No mortgages are required. Liens against property must not be in default and income must be at least five times the annual cost of the loan. No signatures to notes are required except husband or wife.

This plan is particularly favorable for farmers and should result in much new business in that field. The net interest rate to farmers will be reduced because payments may be seasonal, not so often as once a month. Labor costs in the country are much lower than in the cities, and much of the work can be done by the farmer himself. Many things such as fencing, barn improvements, etc., are income-producing and hence self-liquidating.

Money obtained under this plan can be used for paint, fencing, individual electric light plants, heating and other equipment which is built in—in short, any improvement or repair which becomes an integral part of the property.

Benefit Payments Officially Estimated

Official estimates of benefit and rental payments to farmers in the different states on the 1933-34 and 1934-35 adjustment programs have been published recently. Combined payments in Indiana, Illinois, Wisconsin, Minnesota, Iowa, the Dakotas and Nebraska are as follows:

Hogs, 1934-35	$125,940,000
Corn, 1934-35	82,423,000
Wheat, 1933-34	32,242,000
Wheat, 1934-35	33,350,000
Tobacco, 1933-34 and 1934-35	2,706,000
Total	$276,661,000

The following table, giving the total payments, the amounts disbursed and the amount still to be paid to farmers in each of the eight Mid-West states, shows that these states were still to receive 78 per cent of their benefit and rental money:

	Total Benefit and Rental Payments	Amount Paid*	Balance Remaining to Be Paid	Per Cent Remaining to Be Paid
Indiana	$28,589,000	$ 6,641,382	$21,947,618	76.76
Illinois	43,331,000	3,039,254	40,291,746	92.99
Wisconsin	10,194,000	2,146,357	8,047,643	78.94
Minnesota	18,829,000	5,585,224	13,243,776	70.34
Iowa	76,624,000	15,904,006	60,719,994	79.24
North Dakota	33,074,000	10,422,703	22,651,297	68.49
South Dakota	24,535,000	7,082,742	17,452,258	71.13
Nebraska	41,485,000	9,898,094	31,586,906	76.14

*Corn-hog payments to September 4 and wheat and tobacco payments to August 1.

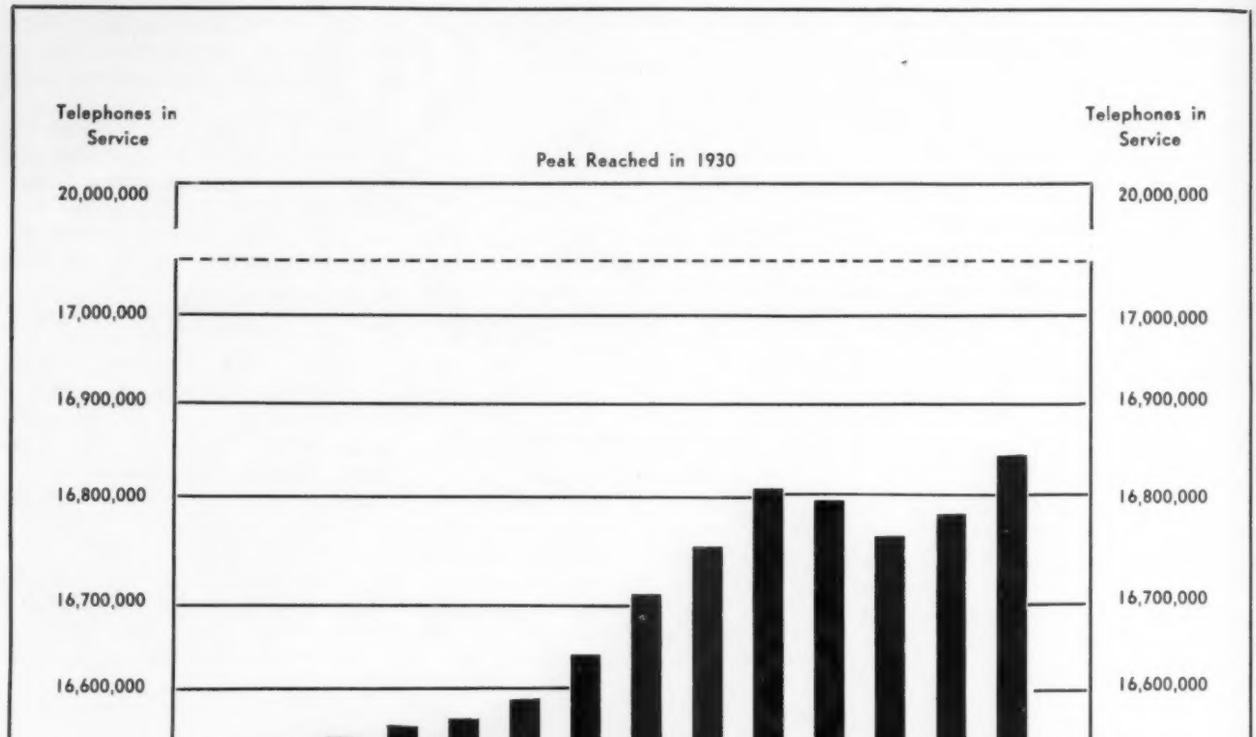
Farm Income Gains Faster Than Payrolls

While both farm cash income and industrial payrolls have increased in the last 12 months, farm income has been rising the faster of the two, after the actual data have been adjusted for normal seasonal variation. This is indicated on the chart on page 14. During the last four months, particularly, farm income has been rising sharply while payrolls have declined.

Payrolls are somewhat higher than a year ago, but much of the increase is absorbed in the higher cost of living. Hence, real urban income is not much

(*Please turn to page 36*)

Monthly Telephone Station Barometer



WITH a reported 1934 increase in farm income of a billion dollars over last year and with indications pointing to less rigid government regulation over industry, the prospects for a continued upswing in telephone stations are exceedingly bright.

The jump in rural income undoubtedly will mean that there will be many farmers ordering their telephones back in service. Perhaps the most encouraging bit of news arriving in industrial centers the past month was the statement of Donald Richberg, NRA director, that fair competition is necessary for economic recovery and that price fixing and production control is a "iridescent dream." This would lead one to believe that the administration has made a slight right turn and private initiative will have more leeway to expand business. This should have a decidedly good effect on the telephone business in metropolitan centers.

General TOLL SWITCHING Plan

● This is Part II of Mr. Osborne's article which is the last installment in the series on "Transmission Basis of Plant Design", which have been published in recent issues of **Telephone Engineer.**

By
H. S. OSBORNE
American Telephone and Telegraph Co.

THE extent to which intermediate switching is limited by the application of this plan is indicated by Fig. 4, which shows the maximum number of switches required under the plan between different types of toll centers. It is estimated that the percentage of long haul messages requiring more than one intermediate switch will, by means of this plan, be reduced by more than 50 per cent.

As an example of the benefit resulting from the adoption of this plan between two remote points, consider a connection which was requested between Pembroke, Ontario and St. Anthony, Idaho. Under the old routing instructions such a call required intermediate switches at Ottawa, Toronto, Chicago, Denver, Salt Lake City, Pocatello and Idaho Falls, a total of seven. The chance of establishing such a connection within satisfactory limits of time was, of course, relatively small and the resulting circuit, when established, did not permit the conversation to be held. Under the general toll switching plan, this call will be routed with switches at Ottawa, New York, Denver and Pocatello, a reduction of three switches. Furthermore, the circuits involved in this connection will be designed with such transmission standards as to give satisfactory conversation.

The routes provided by the plan for countrywide service are also supplemented by more direct routes of equivalent or better service characteristics in cases where the amount of business is sufficient to make this economical. Furthermore, the routes to regional centers are, in some cases, supplemented by alternate routes through what are called "secondary outlets." These are distinguished from the primary outlets in that they do not necessarily have direct circuit connections to all toll centers in their areas but serve a useful purpose as an alternate route for the toll centers connected to them.

The essential features of the general toll switching plan from the standpoint of the interconnection of the switching offices may be summarized as follows:

Regional Centers

Regional centers are switching offices located to cover the various parts of the country and completely interconnected with direct circuits, thus forming the basis of a countrywide toll network.

Primary Outlets

Primary outlets are switching offices having direct circuits to one or more regional centers and each having direct circuits to all toll centers in the area for which it is the primary outlet. Also, each primary outlet is connected to every other outlet within as large an area as practicable, usually within a State.

Supplementary Offices
Secondary Outlets

Secondary outlets are switching offices having direct circuits to one or more regional centers and are intended primarily to furnish alternate routes for toll centers for reaching the regional centers, thus providing a greater degree of flexibility in the plant.

Secondary Switching Points

Secondary switching points are additional switching offices intended to provide routes which are more direct thus reducing back haul for intra-area business.

Transmission Considerations

An important part of the development of the plan was the determination of proper transmission requirements such that any toll connection established in accordance with the plan would have satisfactory transmission efficiency.

Before the perfection of telephone repeaters, the provision of satisfactory transmission efficiency depended largely upon limiting the total attenuation loss of the complete circuit. At the present time the perfection of repeaters has practically removed that limitation. For example, the attenuation in a New York-Chicago circuit in cable is such that without the use of repeaters the ratio of input power to output power for speech currents transmitted over the circuit would be 10^{46}, while by the use of repeaters at the terminals and at 17 intermediate points the ratio actually is 10.

The removal of the limitation for-

From \ To—	Same Regional Area				Another Regional Area			
	Regional Center	Primary Outlet	Toll Center Directly Connected to Regional Center	Toll Center Directly Connected to Primary Outlet	Regional Center	Primary Outlet	Toll Center Directly Connected to Regional Center	Toll Center Directly Connected to Primary Outlet
REGIONAL CENTER	0	0	0	1	0	1	1	2
PRIMARY OUTLET	0	1	1	2	1	2	2	3
TOLL CENTER (directly connected to Regional Center)	0	1	1	2	1	2	2	3
TOLL CENTER (directly connected to Primary Outlet)	1	2	2	3	2	3	3	4

Fig. 4—Maximum number of switches under general toll switching plan.

merly set by circuit attenuation makes possible the increase of the efficiency of circuits to the limit determined by some other characteristic of the circuit. There are various things which under different conditions may determine this limit. One is the effect on transmission of echoes, namely, portions of the speech currents reflected back from the distant end of the circuit or from intermediate points. Another is the distortion due to the building up of greater transmission gain at certain frequencies than at others, which effect may result if repeaters introduce too great an amplification into the circuit. As an extreme case, this might result in a sustained oscillation or singing on the circuit. Other effects which may be important are those of crosstalk between telephone circuits, or of noise induced in the telephone circuits from outside sources, both of which are increased by increasing repeater gains. On the longer connections, echoes are almost always the controlling factor, whereas on the shorter connections, such effects as crosstalk, singing and noise generally are limiting. A reduction in any of these effects generally involves more expensive types of construction.

The difference between the attenuation loss of the circuit and the total transmission gain introduced into the circuit by repeaters is spoken of as the net equivalent. For long telephone circuits it is generally economical to provide sufficient repeater gain so that the circuit can be operated at the minimum net equivalent permissable, this minimum equivalent being determined by the transmission factors just mentioned. Therefore, in establishing satisfactory transmission efficiencies for the overall toll connections in accordance with the toll switching plan, each link must be designed on the basis of the minimum working net equivalent which it will contribute to an overall connection made up of several circuits switched together.

The establishment of satisfactory and economical transmission requirements for the toll circuits laid out in accordance with the plan involves the following steps:

a. The establishment of satisfactory overall net transmission equivalents.
b. The coordinated design of all classes of toll circuits, and of the subscribers' circuits, toll switching trunks and tributary trunks connected to them, in such a way that the desired overall transmission standards will be given at a minimum total cost when suitable transmission gains are provided by repeaters in the toll circuits and at toll switching points

Classification of Toll Circuit Involved	Minimum Working Net Loss of Toll Circuit—db	Maximum Via Operating Equivalent —db	Transmission Margin—db
Toll Center to Primary Outlet	3.0	4.0	+1.0
Toll Center to Regional Center	3.5	4.0	+0.5
Primary Outlet to Regional Center	3.5	3.0	—0.5
Regional Center to Regional Center	4.0	3.0	—1.0*
Primary Outlet to Primary Outlet	4.0	3.0	—1.0
Toll Center to Toll Center	6.0	6.0	—
Direct Toll Circuit (for terminal use only)	9.0	—	—
Toll Terminal Loss	7.0	—	—

*Circuits equipped with echo suppressors may be designed with greater negative margins.

Fig. 5—Transmission design data of general toll switching plan.

c. The economical and satisfactory distribution of transmission gain, permitting all toll circuits to be operated at their minimum net equivalents when this is desirable.

The overall transmission equivalents to be given under the plan are based on standards which have heretofore been used for a large part of the toll business but which it has been impracticable to meet in many cases between widely separated points. With the means now available for operating circuits at their minimum working net equivalents, it was found that satisfactory overall transmission equivalents could be provided under the plan even for the maximum number of switches using standards for the construction of toll circuits very comparable with those already applied to new circuits. Expressed in terms of the transmission reference standard, the plan set up gives a maximum of 25 db overall equivalent within one interconnected area (two intermediate switches) and a maximum of 31 db between any two telephones of the United States and eastern Canada.

In order to determine the most economical distribution of these overall equivalents, a study was made based upon the estimated total number of toll circuits of each class in 1932 and their distribution by length. It is also necessary to include the corresponding estimates for the plant between the toll office and the subscriber, the loss in this part of the plant being on the average about half of the overall net equivalent of the connection.

Based upon these estimates, it was possible to determine, by an economic study, the distribution of the overall minimum net equivalent between these various parts of the circuit which would give minimum total expenses. The toll terminal losses and the minimum net equivalents for toll circuits established in this way are shown in Fig. 5.

In addition to the circuits involved in multi-switch business, the studies connected with this plan necessarily include circuits used for terminal business only, and others for which switching is limited to a single intermediate switch at points where transmission gain is not required. These circuits are associated with the plan because the portions of the circuit between the toll center and the subscriber are common for these circuits and for circuits directly involved in the general plan. Design standards for these classes of circuits are also shown in Fig. 5.

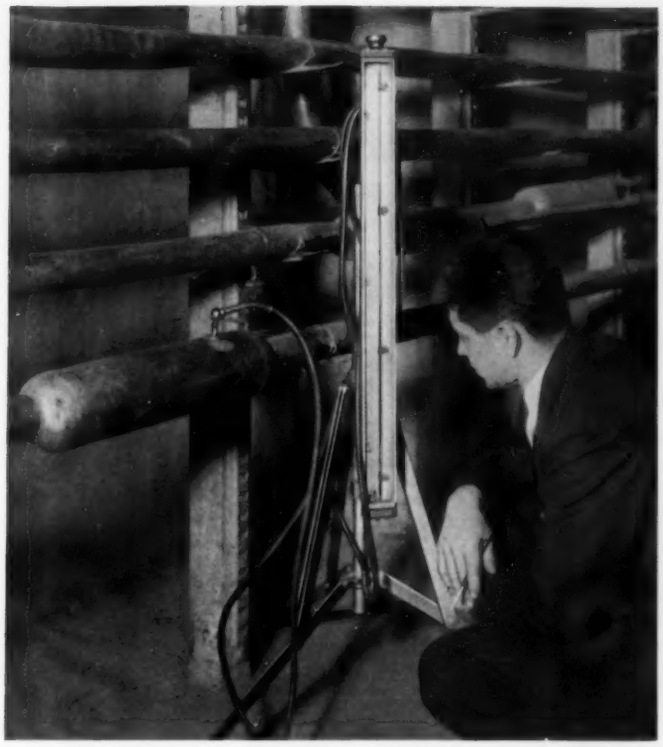
Runs Letter in Advertisement

The Illinois Telephone Co., at Lincoln, Ill., took advantage of an opportunity to tell its public the value of telephone service by reproducing a letter from A. B. Bliss of that city telling the telephone company how he appreciated the service his telephone rendered when his home caught fire recently.

In an advertisement in the Lincoln newspaper the telephone company reproduced Mr. Bliss' letter using a large illustration of a desk stand telephone as a background. The letter reads as follows:

"When a situation arises that demands immediate attention I believe in handling it immediately, hence this letter.

"As you no doubt observed from this evening's Courier, a fire broke out in my home this morning, which might have meant the complete demolishment of my household possessions. You did not, however, notice in the same item, that it was due to the fact of a mere TELEPHONE CALL that the fire department was notified in time to save the house from being gutted by fire. It is little services like this that make me realize more and more the important position that the telephone plays in our everyday life."



Pounds of PREVENTION

By
H. BAILLARD
Outside Plant Development
Bell Telephone System

THE practical application of the old adage "An ounce of prevention is worth a pound of cure" is well illustrated in present day telephone plant practices. Comprehensive programs of preventive maintenance affords a control of much of the plant apparatus which is closely associated with the preservation of uninterrupted service. The accompanying routine tests and inspections are directed at the location and correction of plant trouble in its incipient stage, and have proved most valuable in the elimination of service failures. Prominent examples of this work may be seen in the automatic routine tests of dial central office equipment and the frequent voltmeter tests of subscriber lines. In the outside plant an increasing amount of toll cable is being equipped with a protective alarm system which both warns of accidents to the lead sheath and forestalls the circuit trouble which might otherwise follow from the entrance of moisture. At the present time this system is used on a high proportion of the underground and to a somewhat lesser extent on the aerial toll cable in the Bell System.

Because of the protection afforded by the lead sheath and the decreased susceptibility to storm and other forms of damage, cables provide the most dependable type of telephone circuit. However, it is unfortunately true that accidental punctures of the lead sheath are far from uncommon and they immediately present a potential entrance of moist air or water. Since moisture will quickly destroy the effectiveness of the paper insulation surrounding each conductor, it is important that sheath openings be located and repaired as quickly as possible.

Prior to the introduction of the protective alarm system, direct inspection was the only means of detecting the presence of sheath breaks, besides electrical measurements made after actual conductor trouble developed. As the cables are usually in underground conduit or in aerial runs, the accessibility for inspection leaves much to be desired. In the first case, since the only access is at manholes, thorough visual examination is out of the question, and in the second case, a tedious aerial cable "ride" is involved. Even in favorable circumstances the most painstaking examination will sometimes fail to reveal a minute opening in the lead sheath.

The basis of the newly developed protective system is the continuous maintenance of the cable under gas pressure. When a sheath failure occurs, the outrush of gas will naturally drive back incoming air or water. The drop of pressure inside the cable following the loss of gas through a leak operates an alarm mechanism connected by wire to the repeater station. This system, providing the double service and involving the use of specially designed apparatus, is installed as a permanent part of the cable plant.

A development associated with the pressure maintenance of toll cable is a testing procedure for detecting defects in the solder work or other parts of newly installed cable, either exchange or toll. This check-up is applied independently of the ultimate maintenance of the installation and is widely used on non-pressure maintained systems.

It is interesting to note at this point some of the causes of lead sheath punc-

ture. With aerial cable, a frequent cause is gun-shot, usually but not invariably resulting from carelessness. Aerial cables may also be damaged by flying stone fragments from incompletely shielded blasting operations; by storms and their accompaniment of wind-driven branches and falling trees, and strangely enough by the boring of certain insects and by the gnawing of squirrels. Cables in underground ducts may suffer from such things as digging or blasting during highway or pipe-line construction and from corrosion. This corrosion may arise from a multitude of causes varying from immersion in salt water from a neighboring marsh to the electrolytic action of stray trolley line currents.

Cables at river crossings are exposed to perhaps the most violent mishaps of all, where a ship's dragging anchor can gouge very sizable holes. There are cases on record, however, in which the outflow of gas following such severe injury prevented the entrance of water for considerable periods and so limited the damage that repairs were relatively easy when the cables were hauled up from the river bottom.

Finally, the highly developed technique of solder wiping at cable splices may, like any other manual operation, show an occasional imperfection. The pinhole or pore thus left is a potential entrance for moisture.

To understand the functioning of the protective alarm system something must be noted of the structure of the cable itself. Although a cross-section cut shows an area apparently solidly filled with copper wires and their paper insulation, about half of the cable volume is actually air space. In a cable maintained with the protective system this volume forms the gas reservoir and is charged with dry nitrogen gas to a pressure of about 9 pounds per square inch. Nitrogen is used because it is relatively inexpensive and can be obtained in a very dry condition.

By means of gas dams, called "pressure testing plugs", a cable is divided into individually gas-tight sections. These usually are between seven and eleven miles in length. Such sectionalizing facilitates charging, testing, and repair operations, and provides a sufficient reservoir of gas. The attached illustrative drawing shows the essentials of a plug.

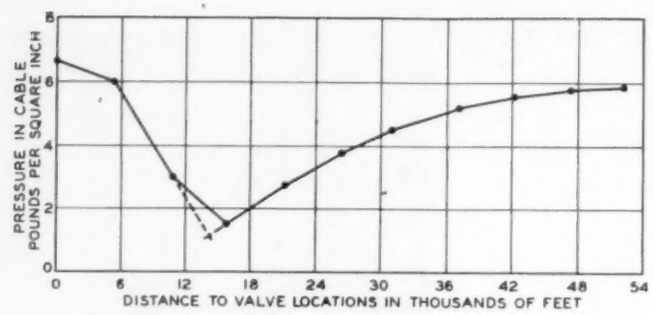


Fig. 2—The exact location of a leak is determined by means of the pressure gradient along the affected part of the cable. Points on the graph indicate positions of the valves where pressure readings were taken.

Each gas-tight cable section is equipped with from three to five of the alarm mechanisms, with each of which is associated a terminal suitable for making connections to the alarm pair and an associated cableman's talking pair in the cable. These mechanisms, called pressure contactors, operate on the fundamental principle of the ordinary pressure gauge. In the accompanying photograph, a contactor is shown with its gas-tight cover removed. In use, a contactor is connected to a terminal which in turn is connected to the cable, so that the pressure of the gas surrounding the "Bourdon" tube is always that of the cable itself. The degree of curvature of this sealed tube is controlled by the cable pressure, the movement of the tube end being amplified by a linkage to actuate the contact springs.

Fig. 3—Pressure contactor with gas-tight cover removed.

Through the periods during which the gas pressure in the cable is above the value at which the alarm operates the contact points are held apart. However if the sheath be punctured, the resulting drop of gas pressure permits the contacts to close, and the alarm at the repeater station operates. All of the contactors are connected in parallel across a single cable pair. Resistance measurements made on this pair from the repeater station by means of a Wheatstone bridge are used to "locate" an operated contactor, and thus the approximate position of the leak.

Cable sheath troubles are accompanied by a relatively slow escape of gas, therefore the internal pressure drop is correspondingly slow. This is mainly due to the impedance offered to gas flow by the closely packed paper and copper forming the cable core. This impedance combined with the large actual volume of gas contained in a gas-tight section, produces a condition of graduated pressures starting with a low point at the break and rising in both directions to a maximum at the ends of the section. It is interesting to note that the impedance mentioned above so restrains gas flow that a completely severed end loses gas at a rate not appreciably greater than a relatively small hole. The drop of pressure resulting from a leak at the mid-point of a section may not be evident at a plug for some time.

After a leak has been detected by operation of a contactor and the contactor has been located by Wheatstone bridge measurements, pressure measurements are made in the vicinity of the operated contactor by a cableman. To facilitate this, valves somewhat similar to automobile tire valves are permanently installed along the cable at intervals of about one-half mile. If the leak is large a gauge of the Bourdon tube type is used for the pressure measurements, while in the case of a small

(*Please turn to page* 28)

DEPRECIATION Procedure EXPLAINED

● Right now depreciation and accounting procedures for telephone companies are important subjects. Telephone companies should follow the National Association's instructions contained in its letters.

IN ORDER to clear up any confusion as to the depreciation procedure and form of the Internal Revenue Bureau, the United States Independent Telephone Association on October 1 sent out a letter to its members explaining just how the seven-column form, which was attached to its letter of September 17, should be filled out. A. L. Geiger, the Association's Washington attorney, gives a detailed explanation of the form which should clear up any difficulties telephone operating companies might have. The letter of October 1 follows:

"Since sending out our letter dated September 17 in which we discussed the Internal Revenue Bureau's depreciation procedure we have had numerous letters from member companies indicating that they are somewhat confused as to the procedure and the use to be made of the seven-column form which we enclosed with the letter. We should have explained that we sent the form out only for the information of our members—that is not to be returned to us nor filed with the Internal Revenue Bureau, but is to be kept by the company as a guide in answering the questions which probably will be asked by a Field Agent of the Revenue Bureau; who will submit a similar printed form for the company to fill out and sign.

"It seems desirable to explain this form in greater detail. We have, therefore, asked Mr. A. L. Geiger, our Washington attorney, to give us a detailed explanation, which he does as follows:

Column No. 1
Date Acquired

"By 'date acquired' is meant either the year of the purchase of the property by the present owner if it was purchased from another owner, or the date of beginning business if the present owner has been the owner of the property and has operated it from the beginning. An explanation can be made in a foot-note or in an accompanying written statement.

Column No. 2
Original Cost or Other Basis and Subsequent Additions by Years

"In this column must be inserted the actual cost of the plant, beginning with the original investment of the present owner and the subsequent additions to plant year by year. (If the actual cost has been increased by appreciation due to an appraisal, the Bureau of Internal Revenue will estimate the appraisal element and restore the cost to true actual investment, because the Income Tax Laws do not permit the basing of depreciation on a write-up in plant.)

"All costs in Column No. 2 should represent actual cash expenditures by the company and this must be certified to on the schedule. If any of the amounts do not represent cash expenditures by the taxpayer, a supplemental statement should be prepared giving a description of the value, character and condition of whatever was used in place of cash (property or securities), how the value was determined, and the basis used in distributing that value to the plant accounts.

"In many cases the present owner will not have complete records to show the plant additions of each year. In such instances the owner should make as close an estimate as possible and state in a foot-note, or supplementary statement, that the figures are estimates; as complete records are lacking.

Column No. 3
Deductions for Sales and Retirements

"In this column should be inserted all retirements, sales, or other dispositions of property so that the plant account used for the depreciation base will not include property sold or otherwise disposed of.

Column No. 4
Cost Remaining at End of Year

"This column is the difference between Columns No. 2 and No. 3, and the amount in this column is the depreciation base for the computation of the depreciation deduction of any year under examination.

Column No. 5
Annual Depreciation Accrual

"In this column should be shown the amount of depreciation which has been included each year in "operating expense"—the yearly credits to the depreciation reserve.

Column No. 6
Charges to Accrued Depreciation For Sales and Retirements

"In this column should be set forth the actual charges made each year against the depreciation reserve on account of retirements. Special charges for other than normal retirements ('extraordinary retirements'), sales or other unusual and exception items should be set forth separately and fully explained.

Column No. 7
Net Depreciation Reserve at End of Year

"In this column should be shown the depreciation reserve balance at the end of the year, and it is obtained by offsetting the balances in Columns Nos. 5 and 6.

"It will be noted that the various columns call for a continuous history of the plant account and the charges and credits to depreciation, and that the purpose of the Revenue Bureau is to fix a depreciation base—the amount in the plant account to be used in figuring depreciation. Every company is asked to write its own history.

"A statement should be prepared on the unexpired service lives of the elements of the plant account. In accordance with a Treasury Department decision (T. D. 4422), the balance is the reserve for accrued depreciation will be deducted by the Revenue Bureau from the total account for the purpose of showing how much of the plant has already been recovered through the depreciation reserve and the balance in the plant account which has not been recovered through depreciation deductions.

"The unexpired life will be divided into this balance in the plant account. This will give the annual amount the Revenue Bureau will consider should be charged to depreciation for the present plant. This requires an estimate of the remaining service life, which requires a very careful determination of

(*Please turn to page* 40)

LINE and DESK

Ray Blain, A. I. E. E., Editor

Q.—What is a composite cable?

A.—This is a cable in which conductors of different gauges are combined under one sheath.

Q.—What is the customary sequence of numbering cable terminals in an aerial plant?

A.—Terminals are usually numbered from the central office toward the end of the cable run, terminal number one being the nearest the central office.

Q.—What size of messenger strand is recommended for use in supporting a 200 pair 22 gauge lead cable?

A.—A 10,000 pound suspension strand would ordinarily be used for this purpose.

Q.—What means is used to make the first attachment on a brick building when the parallel drop wire clamp is used?

A.—A drive type masonry hook can be obtained at a reasonable cost which will be found entirely satisfactory for this purpose.

Q.—When is it considered necessary to lubricate cable before pulling-in underground conduit?

A.—Usually all cable over one inch in diameter which is to be pulled-in clay conduit sections of 300 feet or more should be lubricated. It has been found that if the conduit section contains water, sand or rust that cable can be pulled-in easier without lubricant.

Q.—Is it considered desirable to leave drop wires in place on a dwelling where there is a possibility that a phone will be required again within a few months?

A.—Most telephone companies consider it desirable to leave drop wire in place in such circumstances. It is generally considered desirable to disconnect the drop from the cable terminal, tape the ends and then tape it to the supporting wire. The drop is likewise removed from the protector in the house, pulled-out through the wall and taped in the same manner as at the terminal.

Q.—What is the maximum line loop resistance permissable for satisfactory operation of an automatic subscriber's line?

A.—Different manufacturers specify various limits though one company states that it should not exceed 1000 ohms which includes the resistance of the line conductors and the heat coils, but does not include the resistance of the telephone or the battery feed coils. When lines exceed this resistance local battery telephones are generally used and lines are terminated on long-line impulse repeaters if loop dialing is required. Loops of 200 ohms are sometimes used with simplex dialing.

Q.—Does dust on a ground rod tend to increase the resistance of a ground connection?

A.—A rusty ground rod might make fair contact with the ground due to the fact that rust layers formed in soil are permeable to soil water and consists of particles of iron oxide of no greater insulating quantities than the particles forming the soil itself. However, a rusty rod must be free of paint or grease and if they are dirty they are most difficult to clean. Copper covered ground rods are inexpensive and the use of rusty ground rods are not generally recommended.

Q.—How should a subscriber's telephone set be protected from the weather when installed for outside use?

A.—The usual method is to install the ordinary telephone in a wood or metal box with a suitable door that can be closed when the telephone is not in use. At best such an arrangement is only a makeshift and a cast iron weatherproof subscriber's set made especially for outdoor use is recommended. These sets are reasonably priced and will be much cheaper over a period of time than the makeshift arrangement of installing an ordinary telephone in a weatherproof box.

Q.—Please describe briefly the principle of the slow acting relay and for what purpose is it used?

A.—The slow acting relay is for use in telephone circuits where it is necessary that certain relays remain operated while their circuits are momentarily broken. This type relay has a copper slug fitted tightly to the core which extends from one-quarter to one-half the length of the core. The length of the copper slug is determined by the length of time it is desired to have the relay remain operated after its circuit has been broken. The copper slug constitutes a single turn short circuited winding of very low resistance. When the circuit to such a relay is opened the lines of force, due to the winding cease, but in the decay of the field of the winding a current is induced in the copper slug and the field set up by this current keeps the armature in an operated position. When the induced current reduces to such a value that its decaying field will no longer hold the armature attracted it will fall back.

Placing the copper slug at the heel end of the core does not delay the armature in pulling-up when the coil is energized, but does make it slow to release when de-energized.

When the copper slug is placed on the armature end it will, in addition to making the armature slow to release, also cause it to be slow in pulling-up when the relay is energized.

Q.—What is the difference between a mile of standard cable and the decibel?

A.—Years ago telephone engineers realized that some method of determining transmission loss in telephone circuits was a necessity, and that a standard unit of measure must be obtained. One mile of No. 19 gauge cable, which was commonly used at that time, was selected as a standard unit of measurement. This cable had a capacity of .045 microfarad and a resistance of 88 ohms per circuit mile. We know that energy leaving any one mile section of a long circuit is a definite proportion of the energy entering that same mile section. This is true of sections of standard cable but this unit of measure has the disadvantage that the ratio of energy leaving a mile section to the energy entering a mile section, is not the same at all frequencies. The attenuation increases as the frequency increases. To overcome this undesirable feature a new unit has been adopted for the measurement of transmission loss. This new unit is "distortionless" which means the energy leaving any unit divided by the energy entering that same unit will be the same at all frequencies. The unit differs only slightly from the old mile of standard cable. For several years this new unit went without a name and was referred to as "Transmission Unit" or "TU". Now is has been given a name, the "Decibel" abbreviated "db".

FCC to Hold HEARING on ACCOUNTING

THREE more orders, Nos. 7-A, 9 and 10, have been issued by the FCC. The text of these orders follow:

ORDER NO. 7-A

In a special meeting of the Telephone Division of the Federal Communications Commission, September 24, 1934:

The Telephone Division having under consideration its Order No. 7, adopted August 16, 1934, and a petition in the form of a letter from the National Association of Railroad and Utilities Commissioners dated September 14, 1934, requesting postponement from October 1, 1934, to January 1, 1935, of the date for the filing of exceptions, objections, or suggested amendments to the report in Interstate Commerce Commission Docket No. 25705;

IT IS ORDERED, That an extension of time be granted to November 1, 1934, for the filing of such exemptions, objections or suggested amendments;

IT IS FURTHER ORDERED, That Order No. 7 be set down for hearing and oral argument by the parties on November 16, 1934, before the Telephone Division in its hearing room at Washington, D. C.

ORDER NO. 9

In a Regular Meeting of the Telephone Division of the Federal Communications Commission, September 13, 1934.

The Telephone Division having under consideration Order No. 5, adopted August 16, 1934;

Pursuant to Section 213 of the Communications Act of 1934 (approved June 19, 1934), IT IS ORDERED that each carrier subject to this Act engaged principally in wire telephony, whose gross operating income per year exceeds 50,000, may, on or before November 1, 1934, in lieu of the information required in Order No. 5, file with the Commission a verified report in duplicate showing:

I. Corporate History

A. Give corporate history of respondent carrier, showing capital stock now outstanding, both common and preferred, and the consideration received therefor, subdivided as between (a) cash and (b) other consideration. Explain nature of such other consideration, whether property or otherwise, and money value thereof. In respect of capital stock issues beginning with 1900 show each separate issue and consideration received therefor.

B. Show all acquisitions of property since January 1, 1907, involving entire companies, or parts of companies, having 500 or more stations.

Number of stations involved in each acquisition.

Price paid, and nature of consideration; cash, property or otherwise.

State whether charges for exchange service in territory acquired were increased within two years after the purchase of the property. Give amount, nature, and reason for change in rates if data is available.

II. Service (or Rate) History

Show rates for the principal classes of exchange service, when the data is available, for the exchange in each state serving a city or town having the population nearest to the following list, based on the 1930 census:

Population

500 2,500 10,000 100,000 500,000
1,000 5,000 25,000 250,000 1,000,000
50,000

Such information shall be furnished as of December 31, of the following years: 1907, 1912, 1916, 1920, and 1924 to 1933, inclusive, and the number of stations in the local service area of each exchange must be shown for each such year.

Where changes in rates have been made by approval of public authority, the authority approving the changes must be shown.

Show the rates for the principal classes of toll service for all interstate schedules effective from January 1, 1920, to date. Where intrastate toll rates differ from intrastate rates, the intrastate schedules for each state in which they are applicable must be shown together with the amount of differences in such rates. Charts shall be used to supplement the above toll rate information, and in addition a table of rates for selected routes from Washington, D. C., to at least twenty (20) different points outside of Washington having different lengths of haul, ranging from 100 miles to 3000 miles, air line, must be shown comparing in figures the rates for the principal classes of toll service for all schedules effective between January 1, 1934, and the date of this order.

IT IS FURTHER AGREED that Order No. 5 of the Telephone Division of the Federal Communications Commission be, and the said Order is hereby, held in abeyance, pending receipt and examination of the data to be supplied pursuant to this Order, or until the Division may otherwise order, but otherwise said Order No. 5 shall be and remain in full force and effect.

ORDERED by the Telephone Division of the Federal Communications Commissions, this 13th day of September, 1934.

ORDER NO. 10

In a special meeting of the Telephone Division of the Federal Communications Commission, September 29, 1934:

The Telephone Division having under consideration the orders and memoranda heretofore issued by the Interstate Commerce Commission in its Docket No. 14700, Depreciation Charges of Telephone Companies, effective January 1, 1935, and also having under consideration a communication from the Honorable Andrew R. McDonald, Chairman of the Executive Committee of the National Association of Railroad and Utilities Commissioners dated September 14, 1934, requesting until May 1, 1935, for presenting to this Commission by the State Commissions recommendations as to depreciation rates, and being advised in the premises;

IT IS ORDERED, That parties to this proceeding and other interested persons are hereby notified that on NOVEMBER 16, 1934, following the hearing and argument on the Report of the Interstate Commerce Commission in Docket No. 25705, this Commission will hear, briefly, arguments on:

(1) the effective date of depreciation rate order in Interstate Commerce Commission Docket No. 14700, and

(2) the time and manner of receiving recommendations from State Commissioners in reference to depreciation rates.

FCC HAS TREMENDOUS STAFF TO DO WORK

In preparation for the arduous task assigned to it—the regulation of interstate and foreign communications by wire and radio, and for other purposes, the Federal Communications Commission today announced its set-up of sections, providing for an organization of approximately 595 persons.

The Commission is composed of 7 members, each being entitled under the law to a Secretary and a Confidential Clerk.

On July 17 the Commission organized its Divisions in keeping with the Communications Act. Three divisions of three members each were created with

(*Please turn to page* 44)

NEWS OF THE MONTH

Walter Stead of Virden, Ill., has been hired as general manager of the Macon, Niantic and Illiopolis divisions of the Central Illinois Telephone Co. He will fill the vacancy of Frank Witt, the former manager who will take charge of a telephone service at Clarence, Mo.

The American Telephone Co. complained to the Kansas Corporation Commission that the Denison Telephone Co. was encroaching upon its territory and taking customers. In the hearing was involved the question of whether or not the commission has authority over a mutual concern and the territory it covers.

The Weyauwega Telephone Co., of Weyauwega, Wis., has moved from the exchange building on Main street, which has been the home of the company since its organization, into the new home just built at the west end of the same block.

Leon D. Gmeiner, who has been associated with the Southeast Missouri Telephone Co., at Sekeston, Mo., the past five years, has resigned to accept a position with the Bell Telephone Co. in St. Louis, with which company he was employed before coming to Sikeston.

James F. Bell, chairman of the board of General Mills, Inc., Minneapolis, has been elected a director of the American Telephone & Telegraph Co., to succeed E. V. R. Thayer, who resigned a short time ago.

The Fourteen Hundred Telephone Co., Mason City, Ill., was granted a charter yesterday by Secretary of State Edward J. Hughes. The object of the company is to own and operate telephone lines to furnish service to members at cost. Incorporators are S. M. Cross, Harry Proctor and Carl Patterson.

E. R. Cogswell, general commercial manager of the Illinois Bell Telephone Co., died in Chicago September 19. He had been ill for a considerable time. Mr. Cogswell was well known throughout Illinois. He was a director of the Illinois Telephone association.

The Osage Valley Telephone Co., operating in the counties of St. Clair, Cedar, Henry, Vernon and Bates, Mo., now is engaged in rebuilding lines and exchanges.

The St. James (Minn.) Telephone Co. is putting all lines on the south side of town in cable and under the ground. The work is under the direction of Arnold Stradtman, manager.

Permission to install an underground telephone cable in Pueblo, Colo., was granted the Mountain States Telephone & Telegraph Co., by the city commissioners. The undertaking was made at the request of State hospital authorities.

Immediate alterations in the interior of the Davenport (Ill.) telephone company building has been started in order that the installation of the dial system may be accomplished as soon as possible, according to C. T. Young, manager.

Parts of the basement and the first floor are involved in the work, which will cost about $10,000. The work of rearranging the building will be completed about December 1. The installation of dial equipment is expected to start early in November.

A crew of six men under the direction of A. L. Klingman of Dubuque, Ia., is working out on the country lines of the Bell Telephone Co. in the vicinity of Guttenberg, Ia. The men are replacing all lines, poles and other equipment on the trunks running to Osterdock, Millville, Ceres, Clayton and on two rural routes. The total number of miles of line being replaced will pass the sixty-mile mark. The crew will be kept busy until the middle of December.

In the first week of September the Home Telephone Co., Spokane, Wash., recorded a gain of 104 telephones for Spokane, regarded as an all-time record for the period in the annals of the company. At this rate of gain figures for the current month promised to nearly double the highest previous month this year.

An automatic printer machine has been installed at the Fairbury, Neb., exchange of the Lincoln Telephone Co., to speed up and make even more accurate the handling of Postal Telegraph messages.

The telephone exchange at Roxbury, Kans., has been sold to the Interstate Public Utilities Co. of Wichita, by U. B. McGuire, the local owner.

L. E. Winget, for the last three years division superintendent, Kansas State Telephone Co., with headquarters at Baxter Springs, Kans., has taken a position with another telephone company.

Pounds of Prevention Gas Filled Cables

(*Continued from page* 20)

leak, a sensitive mercury manometer is employed as shown in the photograph at the head of this article. The pressures thus measured are plotted against distance to form a graphic picture of the pressure gradients, one on each side of and sloping towards the low pressure point. By extending these gradients to their intersection the location of the leak is very closely approximated. The attached drawing shows a typical pressure gradient chart.

In general, locations made by the Bourdon tube type gauge or the manometer are accurate enough to indicate that the leak is in a particular splicing section of cable. In underground plant, where the cable is available for inspection only at manholes, it is desirable to make check tests of the location before pulling out and replacing the suspected manhole section or digging up the section for repair. For this purpose a device known as a gas flow indicator is used. The indicator consists essentially of a valve containing an ammonia chamber placed between two sight tubes that have hose connections at their opposite ends. Ammonia is placed in the ammonia chamber, and blotting paper strips saturated with phenolphthalein solution are placed in the sight tubes. The hoses are then connected to valves installed several feet apart on the cable. Gas flows through the indicator in the same direction that it is flowing through the cable, thus carrying ammonia vapor from the ammonia chamber through one of the sight tubes and causing the paper strips in that tube to change color.

In the cases of leaks in aerial cable or at accessible places in underground cable, final determination of the exact point of leakage is usually made by painting the suspected portion of the cable with soap solution and watching for bubbles. A specially compounded soap solution yields bubbles having superior film strength and durability. This method of locating leaks is also applied to the preliminary pressure testing of new installations, as previously described. In testing an individual cable sleeve, for instance, gas is admitted to the sleeve until a localized pressure is built up, and the wiped joints and soldered seam are then painted with soap solution. Any defects in the solder work are thus detected.

The sheath break having been repaired, the cable is recharged to its maintenance pressure and the protective alarm system once more stands on guard.—**Bell Laboratories Record.**

New Air CLEANING Unit For EXCHANGES

(Picture on Front Cover)

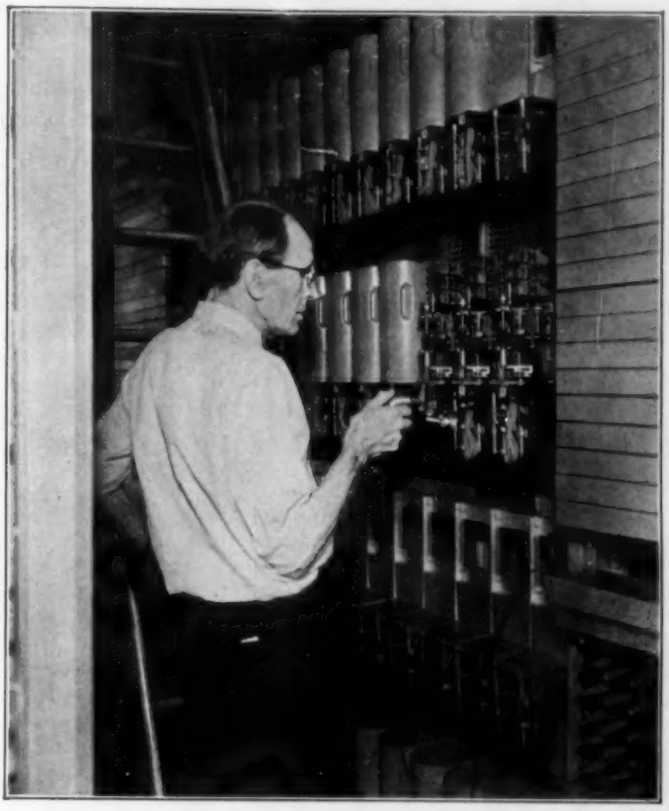
SINCE the inception of the telephone and telegraph, the problem of satisfactorily cleaning switchboard equipment in central offices has been unsolved.

In the past such cleaning as has been done manually has been unsatisfactory, due to the fact that the dust particles dislodged in the cleaning process were largely distributed through the air in the switch rooms and lodged on other parts of the equipment where they frequently cause more trouble than they did in their original location.

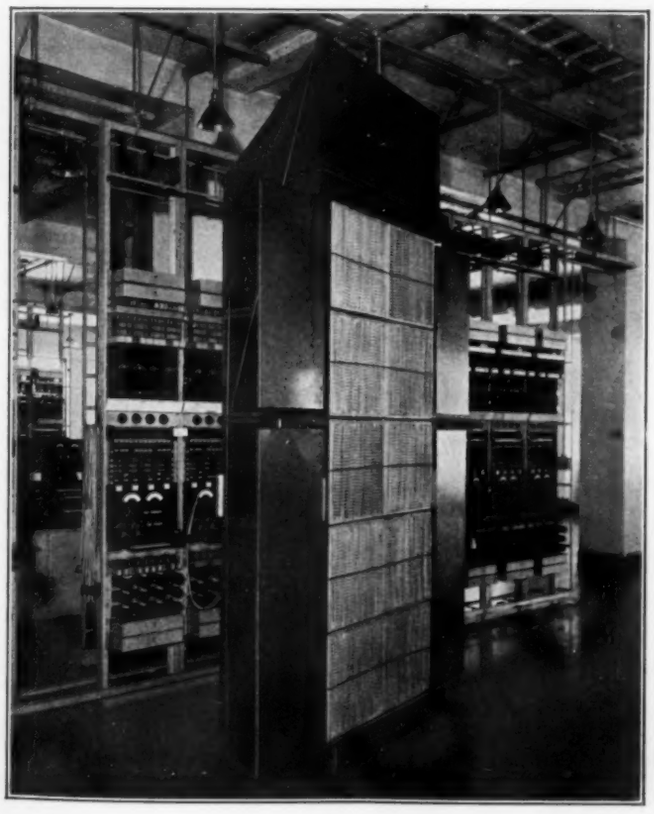
In the absence of adequate means for the immediate collection of the dust dislodged in cleaning, it has been felt by many telephone men that it was best to allow the dust to accumulate in the inaccessible places and disturb it as little as possible.

Recognizing this need, the Curtis Pneumatic Machinery Co. of St. Louis, with the co-operation of telephone and telegraph engineers, have perfected the Curtis Compressed Air Cleaning System for telephone and telegraph central office equipment. Literature describing this new system may be had by writing direct to the Curtis Co.

A number of units have been in use for several months cleaning all types of central office equipment in telephone and telegraph offices. In this cleaning work, the accumulated dirt of years has been, and is being removed daily.



Cleaning step by step automatic equipment with Curtis System



Curtis telephone dust collecting and filtering unit

The Curtis System is a simple method for cleaning telephone and telegraph equipment, wherein a portable dust collecting unit is placed adjacent to the equipment to be cleaned and establishes a suction zone about 10 ft. high and 5 ft. wide enveloping the region to be worked on. Into this suction zone about 6,000 cubic of feet of air per minute is drawn from the room through and about the equipment being cleaned. This air passes into and through the filters of the dust collecting unit and after being thoroughly filtered is returned to the room.

With the operator working in this suction zone, the cleaning is done by carefully blowing off the dirt, using a compressed air cleaning gun. Immediately the dirt is dislodged it is caught up in the air current of the suction zone and carried into and collected in the dust collector filter cells.

Experience has demonstrated that the most delicate equipment can be safely and efficiently cleaned in this manner.

Workmen doing the cleaning with a dust collecting unit are out in the open, doing their work under healthy and comfortable working conditions. In doing this work they become no more

(Please turn to page 36)

RAMBLEGRAPHS

By J. A. Smith

Visiting an inmate of a home for old people in Chicago recently, we were told by the friend that the daily papers were supplied, but only one copy was provided for each floor and the inmate had to read it at once and pass it on to the others on that floor. We related this incident to an executive of one of the largest operating telephone companies in the country, and he stated that TELEPHONE ENGINEER took the same course in his organization.

* * *

We find this method prevails in many companies throughout the country. It may be bad policy for us to make this statement as it may lead others to follow the same course in order to effect a further economy. But there comes to our mind a subject of much discussion in many state conventions that we cannot forego mentioning it at this time.

* * *

Time and again we have heard much time consumed at state gatherings regarding the matter of discouraging non-subscribing neighbors from using the telephones of subscribers. As a publisher we have been importuned to publish articles telling how certain managers combatted this "imposition." And we have consumed much space on this subject. We do think it is an imposition on the subscriber and a hardship on the telephone company.

* * *

But it looks somewhat inconsistent for a telephone company to subscribe for only one copy of a telephone publication, to be read by and passed along to all members of the organization. We were told that often a new copy of TELEPHONE ENGINEER was out before the previous copy reached this executive. Naturally we are flattered that this publication is read by so many employees and executives—five or six was the estimate of this executive. But in these times when there is so much happening in the industry, isn't it stretching economy a little too far to have a reader wait four or five weeks after a publication appears before reading it? Think it over!

* * *

W. S. Pedley, salesman extraordinary of heavy utility equipment, was in our office recently showing a brand new labor saving product for telephone and power companies. Pedley knows more engineers and executives in these industries than probably any other man we know. It is a genuine pleasure to talk with him regarding conditions and utilities throughout the country.

* * *

W. C. Dillon, designer of the Dillon Temperometer writes us from down in Kansas that he is making friends for his Temperometer and that sales are gradually growing throughout the country. Dillon is making further experiments on his instrument and is hopeful that he will eventually have an improved design which will permit the Temperometer to be used for other purposes than testing solder.

* * *

Lloyd Wright, general and genial manager of the Jamestown Telephone Corp., Jamestown, N. Y., is also active in civic affairs, from reports of Jamestown newspapers. Like his father, John H., Lloyd cannot be satisfied with only one job. His latest connections are as a director of the Jamestown Chamber of Commerce, working very closely with President Swisshelm of that body, and is also a member of the school board of that city. Swisshelm is sales manager of the Crescent Tool Company. John H. Wright has been appointed a member of the tax committee of Jamestown. Among the lesser activities of Mr. Wright, Sr., we feel complimented that he is a director of TELEPHONE ENGINEER.

* * *

Z. B. McCarver of Whitesboro, Tex., recently retired from active management of the Northern Texas Telephone Co. exchange at Whitesboro. Mr. McCarver has served 28 years in the industry with the above company and its predecessors. His first connection with the industry was in 1899 when he began with the Huntsville, Tex., exchange of the Southwestern Bell. It is understood that his company provides a pension for its retired employees and Mr. McCarver will receive the benefit of this pension.

* * *

This Oscar Burton person down at Tyler, Tex., just will not let work alone. Not content with doing a first class job for the Gulf States Telephone Co. as its general manager, Oscar gets himself elected as a commissioner for the city of Tyler and proceeds to show the "city fathers" how to economize in the operation of a city. Anyway, that's what the Tyler *Journal*, daily paper of that east Texas city, says. And the *Journal* backs up the assertions with figures to prove the statements made. But nobody will dispute the fact that Burton has done what the Tyler paper attributes to him.

* * *

The editor came home from a trip in the East the other day and in his report paid high tribute to a small city in Ohio in which one of the most progressive Independent telephone men and companies operate—Hudson, Ohio. It is here that William C. Woods and his fine organization, the Western Reserve Telephone Co., function.

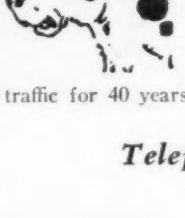
After showing the editor around the telephone exchange, Mr. Wood took him on a tour of Hudson, which envelops many historical landmarks, fine homes of leading Ohio industrialists and the Western Reserve Academy. So loud was Editor Reno's praise of this progressive community that we say "Hats off to Mr. Wood, the Western Reserve Telephone Co. and to the city of Hudson."

* * *

J. R. Kearney, Jr., senior vice president, James R. Kearney Corp., St. Louis, was elected second vice president of the National Industrial Advertisers' Association at its recent convention in Cincinnati. The Kearney exhibit at the convention was given honorable mention.

Allan E. Beach of Littleford Bros., Cincinnati, makers of lead melting and compound furnaces, was re-elected secretary-treasurer of the Advertisers' Association.

* * *



A telephone man visited Chicago World's Fair and tried to crash the gates with a pass issued in 1893. When the gatekeeper called his attention to the ticket he stated that he had been held up in heavy traffic for 40 years. Can you beat it!

When Mrs. Jones

SOUNDS LIKE THIS ➡

to Mrs. Smith

—it's time to switch to

EVEREADY LONG LIFE BATTERIES

"they sustain their voltage"

Basically, you're selling *sound*. And if that "sound" fades and is indistinct, your subscribers have a right to—and *will*—complain.

THE EASE with which they hear one another depends in great measure on the voltage of their local transmitter batteries. The loudness of the voice at the receiving end of the line falls off much more rapidly than the battery voltage, which emphasizes the importance of using batteries which *sustain* their voltage to the best degree.

Eveready Long Life and Columbia Gray Label Telephone Batteries have most excellent sustained voltage characteristics. Tests conducted in strict conformance to those of the Bureau of Standards show that three of either of these batteries, connected in series, deliver 90% or more of their entire life at or above 3.5 volts.

This sustained voltage plus the long life given by these Telephone Batteries means fewer poor-transmission complaints from customers and extra *profits* for the telephone company.

Give your subscribers the good, sustained transmission they have a right to expect and save your company money by using the batteries that have proved to be the best and most economical in the long run . . . Eveready Long Life and Columbia Gray Label Telephone Batteries.

NATIONAL CARBON COMPANY, INC.

General Offices: New York, N.Y. Branches: Chicago, San Francisco

Unit of Union Carbide UCC and Carbon Corporation

Here's a valuable book for your collection—and it's FREE

"TRANSMISSION IMPROVEMENT IN THE LOCAL BATTERY EXCHANGE"

By B. C. Burden, Well-known telephone transmission engineer

SOME OF THE HEADINGS

- Principal factors effecting transmission
- Effect of battery voltage on transmission
- Battery replacement routine
- Current supply arrangement for operators' transmitters on magneto switchboards
- Transmission loss in cable and open wire circuits
- Transmitter adjustment
- Receiver checks and adjustments
- Use of receiver gauge

Send the coupon

NATIONAL CARBON COMPANY, INC., Dept. TE-10
Room 1328, 30 East 42nd Street, New York, N. Y.

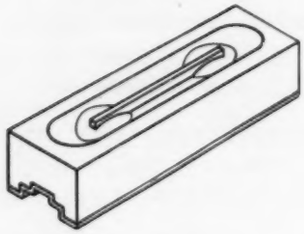
Please send me a FREE copy of your new book, "Transmission Improvement in the Local Battery Exchange," by B. C. Burden—well-known writer on exchange operation problems.

Name.....

Address.....

COOK

TRUE GAP DISCHARGERS



WILL NOT GROUND THE LINE

A postal card will bring you one of these Maintenance Savers.

COOK ELECTRIC CO.
2700 Southport Ave. CHICAGO

Automatic Makes SIGNS For BLIMPS

NIGHT-TIME visitors to A Century of Progress at Chicago this year have been startled by advertising messages spelled out in brilliant red letters, apparently out of the sky. Telephone men will be interested in knowing that these messages, displayed by the two Goodyear airships "Puritan" and "Reliance", are controlled by electrical flashing equipment which was made by Automatic Electric Co., of Chicago, and which consists largely of standard telephone-type relays. The equipment was developed in close cooperation with H. Webster Crum, design engineer of the Goodyear Tire and Rubber Co.

Seen from the ground, the letters do not look large, but they are actually six feet high. Ten letter-display panels are provided—which means that words up to ten letters in length are displayed. Each panel is made up of 33 sections of neon tubing, ingeniously arranged so that any letter or number may be displayed on it by "shorting" the sections of tubing which are not needed for the character. The neon signs are operated on 17,000 volts, secured through transformers from the 110-volt generators of the ship.

Goodyear Blimp "Puritan," showing electric sign panels, which are controlled by telephone type relays.

The system is built around a "translator", a compact machine which takes the message from a small endless punched tape, and, through a combination of relays, "sets it up" on the letter display panels hung on the envelope of the "ship". The message may be of any length, and any number of messages may be sent in a sequence. Also, the message may be entirely changed in a few seconds, by merely replacing the tape with another tape punched with the new message. The necessary tapes are usually prepared beforehand, but the punching machine (also made by Automatic Electric Co.) is designed to be carried in the ship, so that, if desired, the message may be immediately changed enroute, in accordance with instructions radioed from the ground.

These automatic sign flashers were developed to replace two older systems which were too large and heavy for use, and which did not provide for easy changing of the message displayed. The successful solution of this difficult problem, by the use of equipment primarily designed for telephone purposes, should be a source of satisfaction to every telephone man. Display advertising men are watching, with interest, this latest application of telephone switching equipment in other fields.

Officials of the Brownsville (Ind.) Telephone Co. are discussing whether the telephone system will be repaired or discontinued. The exchange is now closed.

Reliable

"RU" Cable Terminal

An Outstanding Contribution to the Telephone Industry

The "RU" is radical in design, yet simple in every respect and thoroughly fitted to the job.

Write for a sample

Reliable Electric Company

3145 Carroll Ave. Chicago, Ill.

TELERING

ECONOMY ◆ RELIABILITY

Order One Now for a 30-Day Free Trial

You must be satisfied. Otherwise return it at our expense.

Reliable ringing service is essential in providing satisfactory telephone service.

Use TELERING and provide the MOST reliable service at the LEAST cost.

If you have any ringing problems, send them to us. We furnish this service free.

POSITIVELY NO RADIO INTERFERENCE

Current consumption negligible.

ONLY ONE CONTACT!

Size 12"x9"x5"

Price $44.00 F.O.B. Elyria

Directly converts Commercial Alternating Current to Telephone Ringing Current.

Sold by Leading Telephone Distributors

TELKOR, Inc., Elyria, Ohio

We want more telephone specialties to produce and market.

Phillips Telephone Cords for Economy

Both by repeated tests as well as under actual conditions of service, Phillips telephone cords show an extraordinarily low cost per year of service life. This is because of the exclusive method of construction used and the careful selection of materials with which they are built.

Everybody knows how ragged and frayed ordinary cords soon get. Phillips cords do not begin to show signs of wear until long after others have been discarded. They are covered with a newly-developed, tightly-woven material to form a compact, smooth, silk-like braid, which retains its attractive appearance even after years of hard service.

Phillips cords will not form a permanent kink. Thus another frequent source of wear is eliminated. And their insulation resistance is not only high to begin with, but remains high even under the most severe conditions.

For a new experience in cord economy, specify Phillips cords on your next requirements.

PHILLIPS PRODUCTS INCLUDE:—Bare and Insulated Copper Wires—Rubber Insulated Wires—Enameled Wire—Magnet Wire —Power Cables—Switchboard Cables—Paper Insulated Cables — Flexible Cords — Electrolytic Copper Rods, Shapes, etc.

EUGENE F. PHILLIPS ELECTRICAL WORKS, LTD.

ESTABLISHED 1889

Brockville, Ontario, Canada

FACTORIES — MONTREAL AND BROCKVILLE

CABLE ADDRESS: PHILELEC, BROCKVILLE

Distributors for Canada: Canadian Telephones & Supplies Limited, Toronto and Vancouver.

Rules on Municipal Owned Utilities

Authority of the PWA to grant funds for the construction of municipal utilities was denied September 20 in an opinion handed down by Federal Judge Albert L. Reeves, Kansas City.

The decision was given in a case involving a plan to construct a municipal light plant at Concordia, Mo., where the Missouri Public Service Co. operates a plant. The city had sought a loan of $30,000 and a grant of $17,000 from the PWA.

Judge Reeves overruled a motion of the city to dismiss a suit of the private utility asking that construction of the municipal plant be restrained by court order.

"It must be ruled," the opinion stated, "that the administrator of public works had no constitutional authority to aid the defendants in the construction of the project and if it were intended by congress to promote that character of construction work under the industrial recovery act, then such purpose impinges upon constitutional inhibitions and is invalid."

Holding that the state has exclusive right to control the manufacture of electricity, Judge Reeves said "it must follow that if congress has no power to control the generation of electricity as in the instant case, it would have no authority to grant aid to the construction of a plant over which it would have no legislative authority."

Court officials said it was one of the first rulings in a case of its kind.

IMPORTANT DECISION BY N. Y. COMMISSION

A decision of extreme importance was rendered by the New York Public Service Commission, August 16, involving the municipal electric property at Boonville, N. Y. The decision is voluminous and deals at length with the subject as to how much a municipal utility may be permitted to earn. The decision holds in its primary findings that a municipality in the State of New York may not charge higher rates than necessary to cover the "cost of service." It directs the city of Boonville to submit additional data and file new schedules in accordance with the general principles enunciated. It points out that the right of a municipality to operate an electric plant in New York is statutory, which makes conclusions based upon decisions in other states difficult. For the same reason the decision is of value in other states only to the extent that it deals with fundamental economic problems. The commission was extremely strict in its interpretation as to what may properly be regarded as cost of service.

Because the principles involved in the Boonville case would be applicable to other municipally operated utilities in the state of New York, the Municipal Electric Utilities Association was permitted to intervene in the case, as were certain villages individually, as amici curiae (friends of the court). It was insisted by interveners that the Boonville plant should pay into the village's treasury a reasonable return on the investment put up by taxpayers. In rejecting this view the Commission said:

"The purpose for which municipal corporations are created and governmental powers conferred upon them is in direct opposition to the theory that profits should be made out of their operations. The main purpose of private corporations is to obtain profit, and it is only because public utilities operate plants which are so essential to well-being and can exist only through unusual powers conferred upon them that they have come under public regulation and their profits limited through the police power of the state. Governments exist for public well-being; they are not created for the purpose of making profits. . . . It may be that in the interest of conservative financing, the obligations issued to build a plant should be gradually reduced and ultimately retired; but if this course is followed, there is no reason in justice and equity why consumers should then be required to pay rates which are in excess of the cost of the service in order that taxpayers may be benefited or that funds may be provided for extra-legal municipal functions. When once consumers have paid for the property out of rates and public funds obtained from other sources have been fully reimbursed for all possible charges or advances, there should be an end to capital charges."

PAYS $23,000 TO SAVE $6,000

Colby, Kansas, is among the towns with municipal electric operation that are referred to frequently as demonstrating success of the municipal ownership idea. Public Service Magazine for September presents some interesting figures on the Colby situation, as follows:

"Colby citizens using 13 kilowatt hours of electricity a month pay 62 per cent more than do customers of the Kansas Gas and Electric Co. in towns of comparable size. A customer using 100 kilowatt hours a month in Colby pays 162 per cent more than the comparable Kansas Gas and Electric Co. customer. The gross earnings of the Colby municipal utilities, water and electric, including credit for fire plugs and street lighting, amount to about $70,000 a year. If the rates were only 50 per cent higher than in comparable Kansas towns (and it is obvious that they are much higher than this) it would mean that the citizens of Colby are paying over $23,000 more for water and electric service than they would pay if privately served. For this $23,000 paid through excessive rates the town gets a benefit of approximately $6,000. Can anybody say that municipal ownership has been a benefit to Colby? Can anybody say that it is better to pay $23,000 in excessive rates than to pay $6,000 in taxes? The whole idea is haywire."

New York Company Makes Changes

James L. Kirkpatrick, president, New York Telephone Co., has announced the following organization changes which were effective October 1st:

John J. Robinson, vice president in charge of operation, has resigned to become president of the New England Telephone and Telegraph Co. with headquarters in Boston.

J. W. Hubbell, formerly vice president and general manager of the Up-State Area to succeed Mr. Robinson.

F. P. Lawrence, formerly general plant manager, Manhattan Area, to succeed Mr. Hubbell.

A. G. Wright, formerly superintendent of construction and engineering, Manhattan Area, to succeed Mr. Lawrence.

Modern Automatic Service in New York

Announcement has been made by American Automatic Electric Company of the sale of complete automatic equipment for the telephone exchanges at Monroe and Highland Mills, N. Y. The purchase was made by the Highland Telephone Company which owns and operates these properties as well as the exchange at Washingtonville, N. Y. It features the adoption by the Highland company of two of Automatic Electric Company's very latest developments — the Strowger Cordless Toll Board and the Type 34A3 Monophone.

Both Monroe and Highland Mills are magneto plants at present—Monroe serving approximately seven hundred subscribers and Highland Mills about four hundred. Under the new set-up, Monroe will be equipped with three hundred lines of 200 point line-finder Strowger automatic equipment and Highland Mills with a 210 line unattended Strowger

(*Please turn to page* 45)

• Signals and Speech

By JOHN MILLS

Here is "a book designed for readers who would like a clear non-technical introduction to the principles of electrical communication. . . . Sixteen short chapters, written in a semi-technical manner and free from mathematics and diagrams, present readable and interesting explanations, of dial switching, telephone repeaters, multi-channel transmission systems and trans-oceanic communication. The engineering achievements in the allied fields of sound pictures, broadcasting, television and stereophonic reproduction are also explained.

The author, an engineer, with a score or more of patents to his credit, has an intimate knowledge of the subject and long experience in scientific exposition.

Price: $2.00

●

TELEPHONE ENGINEER

185 NO. WABASH AVE. CHICAGO, ILL.

DILLON Temperometer

Makes Helper Real Assistant to Cableman MAKES POSSIBLE

Even Temperature

FOR CABLE SPLICING

Furnish your cablemen with Dillon Temperometers and note the improved work performed, and much quicker.

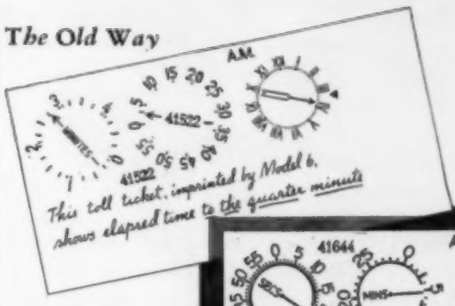
GOOD JOINTS DEPEND UPON CORRECT SOLDER TEMPERATURE.

Accurate in gauging temperature, rigid in construction, convenient size.

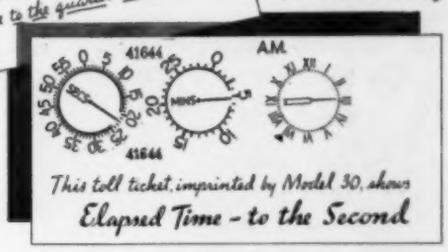
DILLON MANUFACTURING CO.

Suite 1218 — 63 E. Lake St. Chicago, Ill.

The Old Way



The NEW *Way*



How the NEW CALCULAGRAPH PRINTS ELAPSED TIME TO THE SECOND

As everybody in the telephone world knows, the Model 6 Calculagraph prints toll call elapsed time to the quarter of a minute.

Now, to cut still further the overtime allowances on toll messages, the new Model 30 Calculagraph **prints elapsed time to the second.**

This new model is equipped with a self-starting synchronous motor for 60 cycle, and either 20 or 110 volts regulated, alternating current. The mechanism is so designed that it can be fitted to the Model 6 spring-driven Calculagraph at a reasonable cost.

Sample imprints sent anywhere in the world on request. Please state the serial numbers of Calculagraphs now in use in your exchange, and estimates for converting them to the Model 30 will be provided.

THE CALCULAGRAPH COMPANY
50 Church St. Dept. 22 New York City

CALCULAGRAPH
THE ELAPSED TIME RECORDER

1934 Farm Profits For Telephones

(*Continued from page* 15)

higher than last year. The gain in farm income has been substantially greater than in the cost of commodities farmers buy, so that a definite gain in farm purchasing power has taken place.

This gain in farm income will be later reflected in gains in industrial payrolls, but the final adjustment must necessarily be restoration of a fairer balance between farm and city incomes.

Below-normal buying on farms for several years has resulted in an accumulated demand for goods which will be supplied as fast as sale of farm products at higher prices, plus benefit payments, restores the farmers' buying power. Rapid progress now being made in that direction is the most hopeful portent on the business horizon.

Reports from other sections of the country other than the Middle West indicate a bright future for agriculture. *Advertising Age* has conducted a survey of the country and the following reports published by that magazine should inspire telephone men to renew their efforts to sell rural telephones:

SOUTHEAST

There has been no drouth in the Southeast, and crops in many cases have been well above average in this section.

For the past four years Southeastern farmers have been going without many things which they needed and wanted. This fall and winter they will have more cash than at any time since 1930, and it is only natural to assume that they will be in the market, especially for necessities.

MONTANA

While the eastern end of Montana has suffered from drouth, the western two-thirds has enjoyed relatively favorable crop conditions. Montana farmers as a whole, because of the very substantial improvement in prices for many of our most important farm products and because of the $10,000,000 of wheat allotment money that is being distributed, will enjoy the best farm income in many years.

FLORIDA

Not only has there been no drouth in Florida, but one of the best crop seasons in history is anticipated. Citrus fruits will account for at least $10,000,000 more farm income in the state than last year, it is estimated, with further possible gains due to a new marketing agreement which may include a fund of $900,000 for advertising.

NEW ENGLAND

Not only has New England escaped all danger of serious drouth, but many crops are larger this year than last. From present price trends there is every indication that all classes of New England farmers, with the possible exception of fruit growers, whose production has been reduced about 50 per cent due to the severe winter, will materially improve their purchasing ability and will be in the market for all kinds of merchandise during the fall months.

CALIFORNIA

California's 4,250,000 acres of irrigated farm land keep that state from feeling any serious effects from the drouth. Last year the total return from California's agriculture, including livestock, dairying, poultry, etc., amounted to $408,000,000. This year there is an average price increase of 30 per cent on our farm products, which will easily make the total return $500,000,000.

PENNSYLVANIA

There is every reason to expect that total farm income in Pennsylvania this year to be decidedly better than for several years past. Pennsylvania and adjoining states to the east and south are among those rather favored by fate this unusual crop year. The drouth has touched this territory lightly or not at all. As a result, the combined effects of drouth elsewhere and fair-to-good crops here should point to an improvement in sales possibilities.

COLORADO

While the drouth has affected "dry land farming" in Colorado, the irrigation farmer is in excellent shape, with many crops larger than last year's, and the "high altitude farmer" is also in fair shape. Since the bulk of the buying power lies in the irrigated sections, the market outlook for this part of the rural market is said to be excellent.

A. T. & T. Gains

The American Telephone and Telegraph Co. has reported a net gain of 60,750 telephones during September, compared with an increase of 94,000 during September of last year. For the first nine months of the year there was a gain of 226,050 stations, against a loss of 621,000 in the corresponding period of 1933.

New Air Cleaning Unit For Exchanges

(*Continued from page* 29)

soiled than any other of the employes in the switch room.

Thus, it is not necessary for them to wear cumbersome respirators and become literally smothered with dust in the hampering limitations of a confined working space, as would be the case if the cleaning work were done inside of curtains enclosing the equipment being cleaned.

In addition, when working with curtains, there is an ever present hazard of the workman unknowingly striking the curtains against and damaging wire and equipment hidden on the opposite side.

Also, the degree of thoroughness with which the workman is doing the cleaning work can be constantly and conveniently supervised by those in charge while the cleaning is actually in progress, whereas when the cleaning is done inside of curtains intimate and detail observation of the care being exercised by the workmen is not practical and any negligence will be discovered only after trouble results, it is said.

The dust collecting unit immediately draws the dust dislodged into its filter cells adjacent to and on about the same level from which it is removed. Thus, the settling of dust on contacts and equipment lower down, with the resulting trouble, is largely avoided, as is also the re-spreading of this dust when later cleaning the lower portions of the equipment.

Further, the unit is conveniently and easily rolled through the aisles and from one piece of equipment to another as the cleaning progresses. This avoids the labor cost, delay and spreading of dust incident to cleaning up the floor and to moving and rehanging dusty curtains each time the cleaning work moves along the rows of equipment.

Another feature of importance is that the work of the regular attendants who service the equipment is in no way interfered with when using the dust collecting unit. They can conveniently run down trouble without discomfort and delay; whereas if the cleaning was done inside of a curtain it necessitates their entering the dust laden interior of the curtain, delaying their work, ruining their clothes and spreading dust when coming out into the room again, it is pointed out.

These combined features of this cleaning system result in a much lower cleaning cost than has heretofore been considered possible, a better cleaning job and a marked freedom from equipment trouble while the cleaning work is going on, the Curtis company claims.

George Cannon, Pioneer Passes Away

A host of friends in the telephone industry mourn the death of George X. Cannon, president and general manager of the Northwest Telephone Co., Freeport, Illinois, on October 2, in a sanitarium in Milwaukee. Mr. Cannon had been ill for the past two years.

Mr. Cannon was one of the most outstanding and capable men in the telephone industry and his advice and counsel was always sought by the industry in solving its many and varied problems.

Mr. Cannon was born in Circleville, O., November 6, 1882. He entered the telephone business at the age of 18 with the Central Union Telephone Co., Columbus. After seven years with that company, he became general superintendent of the Youngstown (Ohio) Telephone Co., in 1907.

In 1911 he became telephone engineer for the newly-created Ohio Public Utilities Commission. After four years of commission activity, during which time he organized a telephone department and conducted a number of important investigations and valuations, he accepted a position as engineer for the Ohio State Telephone Co.

After making a study and plans for the rehabilitation and enlargement of the Toledo property of the Ohio State company, Mr. Cannon left that concern to become secretary and general manager of the Stephenson County Telephone Co., Freeport, Ill., in January, 1918.

In 1930 he became president and general manager of the Stephenson County company as well as the Northwestern Telephone Co. Upon the merger of these companies into the Northwestern Telephone Co., of Freeport, Ill., late in 1931, Mr. Cannon became general manager of the combined properties. He continued to serve the company in that capacity until his illness forced him to retire from active service on May 1.

Mr. Cannon was president of the Illinois Telephone Association from 1926 to 1928 and of the Independent Pioneer Telephone Association from 1929 to 1930. He was elected a director of the National Association in 1929 and since 1930 has been on the executive committee of the association.

Spokane Shows Increase In Stations

While September seasonally is a period for gains in telephone users, the installations of new phones in Spokane, Wash., last month so far outstripped the seasonal increase as to indicate the month will establish a new record for the Home Telephone and Telegraph.

The company is finding improving conditions in Spokane and contiguous towns in the demand for increased telephone service, with the Spokane area one of the bright spots in the western telephone picture, it was stated. The Pacific Telephone and Telegraph, the parent concern, within 10 days will complete a telephone station at the Grand Coulee dam site, costing about $2000.

New Building

Fred W. Sinclair, manager for the Pacific Telephone & Telegraph Co. at Vancouver, Wash., announced the construction of a new $55,000 building to house the company's facilities here. Construction began September 15 and the building will be completed before the end of the year. Installation of new equipment then will require several months.

LEICH SWITCHBOARDS

Central Battery *and* Magneto

LEICH switchboards are modern in appearance and equipment.

New materials and careful engineering are responsible for the high efficiency characteristic of LEICH switchboard apparatus.

Long life of all parts subject to wear is assured by the correct choice of materials.

LEICH switchboards are favorably known for the accessible mounting of all equipment.

Investigate LEICH switchboards before buying.

LEICH ELECTRIC CO. - Genoa, Ill.

Power Line Noise Reduction

(*Continued from page* 12)

cuit. A grounded circuit is 100 per cent unbalanced; hence, telephone companies operating grounded circuits can expect little else than excessive noise where these circuits are involved in lengthy parallels. Metallic circuits can be kept well balanced if (1) all splices are carefully made with some approved form of sleeve or roll type joint, (2) if electrical leakage to ground due to trees or wires down on cross arms be kept low, and (3) if line wires are periodically transposed so as to expose equal lengths of each wire to adjacent wires. In addition to the requirement for keeping the telephone line itself in balance, it is also necessary that associated equipment at both subscribers stations and central office be well balanced. One source of unbalance, often found in telephone lines, which is quite apt to cause severe inductive interference is the use of grounded ringers on metallic lines; that is, substation ringers connected from one side of the line to ground. The impedance at voice frequencies (at 1000 cycles) of an ordinary telephone ringer ranges from 10,000 to 25,000 ohms; hence, connecting a ringer to ground is equivalent to connecting an impedance of about this value from line to ground. This results in circulating line currents which appear as noise in the connected telephone instrument. The only complete remedy for noise due to this source is to change the type of ringing and connect the ringer directly across the line. It is possible to greatly minimize noise from this source by the use of special high impedance ringers in place of the normal ringer. These special ringers which are available through supply houses are designed to have impedances of approximately 200,000 ohms at 1,000 cycles; hence, greatly limited, as compared to the regular ringer, the circulating noise current which would tend to flow through a ringer connected to ground.

In considering a change from a balanced ringing system to grounded type ringing, telephone companies should carefully go into the noise problem and if length parallels are involved it would be wise to experiment with ringers connected to ground along the line before cutting over to this type ringing in order to make sure that a line can satisfactorily be changed from metallic to the unbalanced system. Repeating coils must be well balanced electrically or they will introduce noise in telephone lines where parallels are involved. Likewise coils and other series equipment in the office.

Principle No. 7 refers to the necessity of keeping monentary disturbances or abnormal conditions in power circuits at a minimum.

The term "abnormals" refers to unusually large voltages or currents which are set up in power lines due to unbalanced conditions resulting from improper operation of power line switching equipment, or due to shorts, grounds, or opens in power lines or apparatus resulting from causes other than faulty operation.

Abnormals, because in most cases they represent large residual components are particularly severe from an inductive standpoint.

Examples of "abnormals" due to faulty operation of power apparatus are (1) switching operations which do not open or close all of the phase wires of a transmission line at the same time, (2) certain types of lightning arrestors which must be periodically charged from the power source.

Examples of abnormals resulting from causes not due to switching are shorts, grounds, or opens which may occur either in the line itself or in connection with connected apparatus for instance a broken down bushing in a high voltage line transformer.

Abnormals are often so severe in their effect on adjacent communication circuits that service on an entire lead may be disrupted temporarily.

They may even result in voltages of sufficient magnitude to be actually hazarous being induced in paralleling telephone circuits.

Remedial measures should of course be of the preventative type such as better maintenance, high grade line construction, and the use of modern approved type of switching equipment.

Int'l Telephone Has 6 Mos. Net

International Telephone & Telegraph Corp. and its associated companies, for the six months ended June 30, 1934, reported a net profit of $1,697,932, after taxes, depreciation charges of associated companies and interest on debenture bonds, equal to 27 cents a share on 6,399,002 shares, as compared with a net loss of $642,310 in the first half of 1933.

The Postal Telegraph and Cable Corp. and associated companies, subsidiaries of International Telephone, for the six months ended June 30, 1934, showed a net loss of $255,296, after taxes, depreciation charges of associated companies and interest, as against a net loss of $708,505 in the first half of 1933.

Ordered To Make $19,000 Refund

A decision of a three-judge federal court, filed at the U. S. district court clerk's office at Pensacola, Fla., orders the Peninsular Telephone Co., to repay $19,000 to subscribers.

The decision also dismisses the telephone company's motion to prevent the Florida railway commission from enforcing certain rate reductions.

The railway commission's order was made almost a year ago. The telephone company obtained permission from the court to continue charging rates previously in force but with a bookkeeping arrangement so that subscribers should be repaid the excess fees if the court eventually decided to uphold the railway commission's order.

The decision of the three-judge court, sitting in Jacksonville, upheld the railway commission and ordered the telephone company to return the amount of fees over and above the rates set by that body.

The order says the repayments shall be made within 60 days.

The judges are: N. P. Bryan, circuit judge; Alexander Akerman and A. V. Long, district judges.

Trustee Named

Clement A. Nance has been appointed temporary trustee for the Standard Telephone Co. by Federal Judge John P. Barnes, Chicago, it was announced by W. J. Walsh, chairman of the Walsh committee, representing the holders of the company's first lien collateral trust 5½ per cent bonds.

Request for a trustee was made in a petition filed under section 77-B of the bankruptcy act by the Walsh committee. Mr. Walsh stated that the committee now has on deposit more than one-third of the bonds.

New Equipment

New equipment has been received and is being installed at the telephone exchange at Hutchison, Kansas, to modernize the plant, at a cost of $12,000.

Sells Exchange

U. B. McGuire has sold the Roxbury, Kans., telephone exchange to the Interstate Public Utilities Co. of Wichita. Mr. McGuire had owned the Roxbury system for about one year.

Coffing Hoists

"The Universal Tools"

Telephone Linemen Find the Model A COFFING HOIST Invaluable for Pulling Guy Wires, Messengers, Underground Cables, etc.

The Model A COFFING HOIST only weighs 14 pounds, is rated at ¾ ton and tested to 100% overload. Also made in 1½, 3 and 6 ton sizes.

We manufacture a variety of line equipment.

Catalog furnished upon request.

Coffing Hoist Company

DANVILLE -:- ILLINOIS

MASTER PLIER

$1.50

They're Going Fast

A limited supply of the MASTER 7-inch telephone lineman pliers. A BARGAIN YOU CAN'T AFFORD TO PASS UP.
Formerly sold for $3.50.

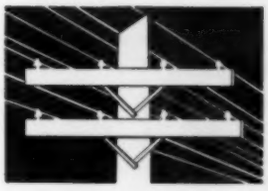
With a Master 7 a lineman carries a smaller and more convenient tool—but one that will do as much as any other 8-inch because of the multi-power head—a stronger and more durable tool—better balanced and handier working—easier on the wrists—greater power—and, in ordinary use, unbreakable. An all-around, fine article, in which there is continued pride of ownership and consequently an inclination to treat it as a plier should be treated.

OUR SUPPLY WON'T LAST LONG.
SO ORDER YOUR PAIR TODAY.

Dillon Manufacturing Co.

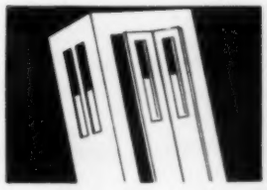
63 E. Lake St. Chicago, Ill.

FOR EVERY TELEPHONE NEED..



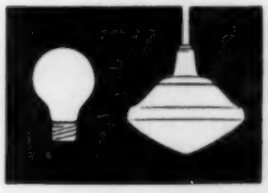
LINE MATERIAL... A single insulator. Or miles of pole line. Graybar can supply construction materials and tools for *any* telephone need. Quickly and economically.

EXCHANGE EQUIPMENT... Exchange equipment of many types is readily available from Graybar. Equipment from Graybar is standard, quality equipment. Write for more detailed information.



OUTSIDE EQUIPMENT... Equipment used outside of the exchange can also be had from Graybar. Note:—you'll find a Graybar distributing house right in your vicinity.

LAMPS AND LIGHTING... Good lighting is essential to good telephone service. Graybar's line of fixtures and glassware is unusually complete and up-to-date. Let a Graybar lighting specialist advise you.



EVERYTHING ELECTRICAL... Graybar, with its 65 years of experience, stands out as the logical source of anything and everything electrical. Write us for information on electrical supply problems.

..60,000 electrical items

GraybaR

ELECTRIC COMPANY

OFFICES IN 74 PRINCIPAL CITIES. EXECUTIVE OFFICES, GRAYBAR BLDG., N.Y.

Depreciation Procedure Explained

(*Continued from page 21*)

the various elements of plant and is necessarily an engineering estimate. This requires, too, an estimate of the total service life—past and future—how long the present plan has been in service and how much longer it will last. This, of course, means an estimate of the life of the plant as a whole based on estimates of the life of the various parts of the plant.

"Taxpayers are warned specifically against entering into informal agreements with Field Agents on the question of the remaining service life, because it is a matter which can not be determined with even reasonable accuracy without very careful study of the past history and present condition of the plant.

"Every company should be giving careful attention to getting together the data called for on the form, and studying the answers to be made to any questions that are likely to be asked pertaining to service life, depreciation practice, etc.

POWER OF ATTORNEY (DESIGNATION OF AGENT)

"With our letter to you of September 17 we enclosed three copies of a form for you to fill out appointing this Association as your agent in Washington to receive orders and notices from the Federal Communications Commission. If you have returned these to us pay no attention to this paragraph, but if you have not please **have those forms filled out at once,** put one of them in your files for your own records, and send the other two to us—one of which will be filed by us with the Federal Communications Commission, and the other retained in our files for our records. It is essential that we secure these Powers of Attorney, or as we have generally called them 'designations of agent' to enable us to be of constant assistance to our member companies and cooperate more closely with the Federal Communications Commission. Please do not delay any longer, but **send the forms in at once.**

COMMUNICATIONS COMMISSION ORDER No. 7A

"On August 16 the Federal Communications Commission issued its Order No. 7 relative to the Report 25705 of the Interstate Commerce Commission on the objections of certain of the State Commissions to parts of the accounting system. Under Order No. 7 any comment on the I. C. C. report was to be filed by October 1st. The State Commissions requested further time in which to file their statement. This Association also asked for an extension of time. The Communications Commission has granted an extension, fixing the latest date for receiving statements as November 1, and setting November 16 as the date for a formal hearing on the questions involved. This amendment to Order No. 7 is listed as Order No. 7A (dated September 24), copies of which have been sent out by the Communications Commission and served on the Association for those of its members that have filed Powers of Attorney. The companies immediately concerned in this accounting procedure are those that have over $50,000 annual receipts, which are known as Class A and B Companies. No system of accounts has been prescribed as yet for companies having less than $50,000 annual receipts. The Association proposes to file a statement in behalf of its member companies, both those that are directly interested as being under the Communication Commission's jurisdiction so far as accounting rules are concerned and those that are not under the Federal Commission's accounting regulations but are under the regulation of the State Commissions (therefore interested in whatever proposals may be made revising the accounting system). The Association also will appear in behalf of its member companies at the hearing November 16th."

Association's Letter of Sept. 17

"INTERNAL REVENUE BUREAU'S DEPRECIATION PROCEDURE: In our letter to members dated August 2 we stated that we expected to issue a bulletin on the Internal Revenue Bureau's new investigation of depreciation deductions. The Bureau's decision to have Field Agents check up on the depreciation deductions of companies was discussed at some length by Mr. A. L. Geiger, our Attorney at Washington, during the annual convention of the Association in July. We expected to issue that bulletin immediately after the convention, but found there had been some confusion among the Collectors of Internal Revenue as to the instructions of the Internal Revenue Bureau; some Collectors understanding that one procedure was to be followed, and others a different procedure. The first procedure called for the answers to 14 questions, the second the answers to 7 questions. After a number of discussions of this question with the officials at Washington, Mr. Geiger advises us as follows:

'On February 28, 1934, the Treasury Department issued Treasury Decision 4422, and a supplemental memorandum known as Mimeograph 4170, which will completely change the method of computing depreciation deductions in income tax return. The Treasury decision is the result of a special study made by direction of Secretary of the Treasury Morgenthau of income tax deductions taken in the past years, which convinced the Secretary that in many instances taxpayers are taking deductions greater than they are entitled to on the basis of the normal service lives of the assets to be depreciated. The decision was drawn for the purpose of showing more clearly than the prior decisions on this subject the age, condition and service life. The decision makes no change in the fundamental engineering and accounting principles on which the depreciation deduction is based, but it requires a more intensive study of the age, service life and condition of the taxpayer's assets in order to prove the deduction more accurately than it has been computed in past years, and also throws on the taxpayer the entire burden of furnishing the evidence to support the deduction.

'With Mimeograph 4170 there has been issued a seven column form which is for the use of public utility companies, including telephone companies. In some parts of the country, a fourteen column form has been distributed with Mimeograph 4170, but this larger form is intended for the use of companies other than public utilities and should not be filed by any telephone company. The seven column form for the use of telephone companies is attached hereto.

'The unexpired service life of the elements of the plant account is the most important problem in connection with the preparation of the data required by T. D. 4422. In accordance with this decision, the balance in the reserve for accrued depreciation will be deducted from the total plant for the purpose of showing how much of the plant has already been recovered through the depreciation reserve and the remaining amount of the plant cost which has not been recovered through depreciation deductions. The purpose of T. D. 4422 is to prorate the unrecovered cost over the remaining service life. This requires an estimate of the various elements of plant and is necessarily an engineering estimate. Taxpayers are warned specifically against entering into informal agreements with Field Agents on the question of the remaining service life, because it is a matter which

cannot be determined without very careful study of the past history and present condition of the plant before it can be determined with even a reasonable accuracy. After the remaining unexpired life has been determined, it will be divided into the unrecovered cost which will give the amount of unrecovered cost to be recovered as a depreciation allowance in each year of the remaining service life.'

"We enclose a copy of the seven-column form mentioned by Mr. Geiger as having been issued by the Internal Revenue Bureau with Mimeograph 4170. We call the attention of our companies to Mr. Geiger's warning against their entering into informal agreements with Field Agents on the question of service lines. Such agreements are unintentionally entered into during conversations with the Field Agent. Such conversation statements have been used by the Field Agent as a part of the tax payer's statement; therefore, we are putting special emphasis against making any such informal statements and against anyone but the proper accounting officer discussing depreciation deduction schedules with the Field Agent. In conversation an offhand statement is made that later is found incorrect, which may have been simply a guess on the part of the speaker and cannot be confirmed by records. We therefore urge care in the preparation of statements; which is a rule that should be followed in connection with all Government matters.

"POWER OF ATTORNEY TO RECEIVE ORDERS: Under Section 413 of the Communications Act, every carrier is required to designate in writing an agent in the District of Columbia upon whom all orders, etc. can be made by the Commission. The Association has acted as such an agent for its member companies in connection with receiving orders and notices from the Interstate Commerce Commission. We are informed it is necessary for the companies to file new authorizations with the Communications Commission designating us as their agent to receive copies of notices from that commission. We are, therefore, enclosing three copies of the form to be signed by the proper officials of your company. Return two of these forms to us and retain the other for your files. This should be done *immediately* and should be done by all companies without regard to whether they are classified as "connecting carriers" under Section 2 of the Act. Do not neglect to do this at once. There is no charge for this service by the Association as it is one of the services paid for by membership dues."

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NORTH CHICAGO, ILL.

W. J. O'Hea, Telephone Leader, Dies

The telephone industry, which he had served the greater part of his life, was dealt a severe loss in the death of William J. O'Hea, secretary of the Rochester (N. Y.) Telephone Corp., September 18.

Also Rochesterians who had come to know Mr. O'Hea as one of their leading and most influential and trusted leaders were saddened by his death. In an editorial, the Rochester Times-Union, conveyed the true feeling of the city which Mr. O'Hea had so unselfishly served, when it said in part:

"A community in which he had long been an appealing and influential figure is saddened by the death of William J. O'Hea, secretary of the Rochester Telephone Corporation. Few business men in Rochester had a larger number of genuine friends, for Mr. O'Hea was instinctively a friendly man. He was the type of executive to whom a public utility is a public trust, and in his wide contacts he made his own warm and winning personality felt as an influence for public good. There was no pose about his ready cultivation of friendships. . . .

"His death while in the fullness of his business career and community activities, and at the comparatively early age of 53, gives the city a peculiarly poignant sense of loss. His place will not easily be filled."

Mr. O'Hea entered the employ of the New York Telephone Co. in New York City in 1897 as a junior clerk in the auditing department. Promotion came rapidly and after serving as assistant chief clerk of the adjusting department and district chief clerk he was appointed manager of the 38th Street Commercial Office in 1910.

Soon thereafter Mr. O'Hea was transferred to Buffalo to become chief clerk of the division general manager. When the position of district manager of Rochester became vacant in 1912, Mr. O'Hea was chosen to fill the post.

Properties of the New York Telephone Co. and the Rochester Telephone Co. were merged in 1921 and then Mr. O'Hea was appointed assistant to the president of the new combine. In 1927 he was elected secretary.

Only three years after his arrival in Rochester, Mr. O'Hea was elected president of the Rochester Rotary Club. Later in the same year of 1915 at the Rotary International convention in San Francisco he was elected district governor for New York and New Jersey.

Abbott, Illinois Bell Head Retires

William Rufus Abbott retired September 26 as chairman of the board of directors of the Illinois Bell Telephone Co. Under the company's plan of retiring employees at the maximum age of 65, the board of directors accepted the chairman's notice. It also adopted resolutions commending Mr. Abbott's long period of service with the company.

Mr. Abbott will remain on the board as a director, which he has been for several years. Mr. Abbott's retirement became effective October 1.

No successor to Mr. Abbott as chairman was announced.

Position Wanted

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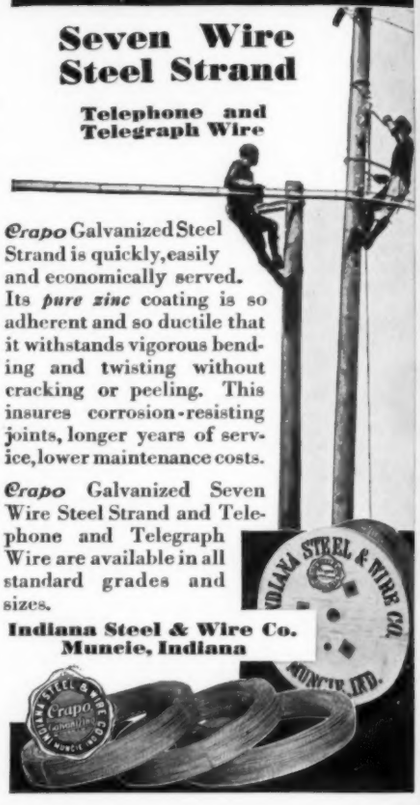

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A post card brings full information and prices.
The
TELEPHONE REPAIR SHOP
Rogers Park Station, Chicago, Ill.
We Specialize in Rebuilding Transmitters

FCC To Hold Hearing On Depreciation

(*Continued from page 27*)

Chairman E. O. Sykes, serving on each division.

The Secretary of the full commission, Herbert L. Pettey, under the new plan has under his jurisdiction the following sections and personnel: License—36; dockets—4; minutes—3; public reference, correspondence and records — 25; accounting—7; duplicating and supplies—9; press—3; sub-clerical section—5; a total of 92.

The engineering department, of which Dr. C. B. Jolliffe is chief engineer, will probably be the largest division of the commission, providing for 174 employees, of whom 110 will be in the field force, checking broadcast stations to see that they keep on their assigned frequency, thus providing good radio reception for listeners.

This department is composed of 5 sections—Telegraph, Broadcast, Telephone, International and Field. The Telegraph section, of which E. K. Jett is chief, is to be composed of 23 persons; the broadcast section, Andrew D. Ring, chief, 18; telephone, W. G. H. Finch, chief, 17; international section, Gerald C. Gross, chief, 4; field section, W. D. Terrell, chief, 112.

The second largest unit will probably be the accounting, statistics and tariff section, to be composed of 160 persons. This section will be charged with the task of analyzing and summarizing the numerous reports filed, and to be filed with the commission in response to its orders to radio stations, telegraph and telephone companies. Arnold C. Hansen has just been named chief accountant of this section. He has been senior examiner of the Interstate Commerce Commission in the bureau of formal cases for a number of years, and assisted Dr. W. M. W. Splawn in the house investigation of communications holding companies.

The third largest section will likely be the valuation department. The tentative set-up calls for 117 employees by this unit. The organization of the law department, of which Paul D. P. Spearman is general counsel, has not been completed, nor the examiners' unit. Recently the commission named Frank Roberson, of Pelham, N. Y., and George B. Porter, of Des Moines, Inc., Assistants to the general counsel.

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Modern Automatic Service In New York

(Continued from page 34)

C-A-X.

The new toll board to be installed at Monroe, will be of the remote control (cordless) type with six positions initially equipped. This type of toll board has no jacks, plugs or cords. Standard Strowger switches perform all the mechanical work of setting up toll calls. In addition to the saving in maintenance as a result of cordless design, this type of board has many other advantages—namely, it increases speed, accuracy and efficiency and lowers operating costs by permitting each operator to handle a greater volume of traffic. Subscribers in Monroe and Highland Mills will be connected directly to the toll board by dialing "0".

The decision of the Highland Company's officials to install only Type 34A3 Monophones (the new self-contained set) in replacing their magneto instruments is a note-worthy one. It is probably the first instance on record of a telephone company standardizing completely on these modern, self-contained instruments. The advantages of this policy to the Highland Company are obvious as it eliminates necessity of purchasing and installing separate ringer boxes and, at the same time, give the company's subscribers the very latest type of handset telephone. Furthermore, the telephone company will start at "scratch" in the race against obsolescence—an advantage which should always protect the company's investment and an advantage not obtainable with older types of telephones. All of the central office equipment and telephone instruments are to be the products of Automatic Electric Company of Chicago.

George B. Mailler, president of the Highland Telephone Company, is one of the pioneer telephone men in the state of New York. He helped to organize the company in 1899 and has been president ever since. F. H. Florance, secretary and general manager, has been largely responsible for the successful operation of the company, having acted in his official capacity continuously since 1906. He has been ably assisted in recent years by his son, F. S. Florance, who played an important part in planning the conversion of these properties to automatic operation.

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6 Ft.	4 Cond. Desk Stand Cord Any Trim.	35c
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A better cord for less money than you can buy any place else. All above cords covered with highest quality brown mercerized combed peeler yarn.

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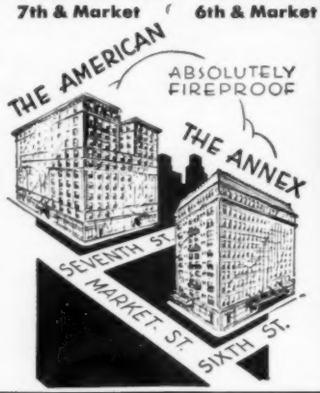

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